THE RELATIONSHIPS BETWEEN TOTAL QUALITY MANAGEMENT FACTORS AND WORK OUTCOMES IN A MAQUILADORA

BY

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Dedicated to my parents, Masateru and Shizue Chinen

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Chinen, K., Jun, M., & Zsidisin, G. (1998). The Links between TQM and Mechanical Solidarity in Japan. In G. Rosile (Ed.), Proceedings, International Business and Ecology Research Yearbook, (pp. 41-46). IABD.

Chinen, K. & Hampton, G.M. (1998). Impacts of Selected Social Factors on Attitudes toward Foreign Direct Investment: U.S. and Japan. In D.G. Ohmer and M.Scheid (Eds.), Proceedings, 5th Annual South Dakota International Business Conference, (pp. 267-280).

Chinen,K. (1999). Understanding TQM in Japanese Automobile Manufacturers: Perspectives from Organizational Theory. In C.B. Meek and S.J. Schvaneveldt (Eds.), Proceedings, AJBS (Association of Japanese Business Studies) 12th Annual Conference.

Chinen,K., McQuitty, S. & Hampton, G.M. (1999). How Open are the Japanese?: An Examination of Attitudes toward Foreign Direct Investment. In C.B. Meek and S.J. Schvaneveldt (Eds.), Proceedings, AJBS (Association of Japanese Business Studies) 12th Annual

Chinen,K., Hampton,G.M., & Enomoto,C.E. (1999). Aggregate Images of Country-of-Origin: An Investigation of American and Japanese Products. In J. W. Wilson (Ed.), Proceedings, 15th Annual Atlantic Marketing Association Conference, (pp. 302-308).

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ABSTRACT

THE RELATIONSHIPS BETWEEN TOTAL QUALITY MANAGEMENT FACTORS AND WORK OUTCOMES IN A MAQUILADORA

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Western and Japanese researchers identified and claimed that various total quality management (TQM) factors, such as problem-solving environment, communication, reward and clear objectivity, are positively related to work outcomes, such as satisfaction, commitment, and financial measures. However, we do not know how TQM factors are related to outcomes in developing countries.

The objective of this thesis is to empirically investigate the effectiveness of total quality management (TQM) practices in the maquiladora industry. In particular, the study focuses on the problem-solving teams and their work outcomes by analyzing a Japanese owned automobile component manufacturer located in the city of Juarez, Chihuahua, Mexico.

The results of this study indicate that clear, organized, and concise communication was important for organizational members to perceive job satisfaction.

This study provides some empirical evidence of the hierarchical nature of Mexican culture. Organizational members expect a leader and supervisor to participate and take initiatives in TQM programs. The Mexican workers have great respect and expectations for a leader and his or her leadership in carrying out TQM programs.

It was found that the participants with higher education showed significantly higher organizational commitment than those with lower education.

A conceptual model of the relationship between TQM factors and work outcomes was presented along with research hypotheses for testing the model, results of statistical analyses, and managerial implications.

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Chapter 1

INTRODUCTION

It has been almost two decades since the core philosophy of total quality management (TQM) introduced by W.E. Deming, Joseph Juran, and Philip Crosby gained general acceptance in the world. During those decades, TQM has become a social movement (Hackman & Wageman, 1995). Today, it has spread from its manufacturing origins to educational institutions, health care organizations, hotel organizations, and government agencies. TQM has become increasingly popular in the press, with consultants, and in Academia (see TQM issues in Academy of Management Review in1994).

Most of the TQM champions claim that TQM helps a company increase customer satisfaction, employee satisfaction and productivity (Wollner, 1992). Research has confirmed the strategic benefits of TQM and better quality has been shown to contribute to greater market share and return on investment (Cole, 1983; Phillips, Chang, & Buzzell, 1983). TQM also contributes to lower manufacturing costs and enhanced organizational performance (Garvin, 1983). This approach, which has become a management philosophy, involves all aspects of the organization and leads to a process of continuous improvement.

Traditional quality management is based on inspection after an activity has been performed or completed in a manufacturing facility. Both Deming

and Juran insist on a people-driven organization where quality is built into each unit and process so that inspection is not needed.

Quality and Quality Gurus

Expression such as quality, quality assurance, quality control, total quality, total quality management, and total quality control have all been used to reflect our understanding of the changing concept of quality. Several proponents of quality have played important roles in establishing the importance of quality to receive significant acceptance. Three of these individuals are Crosby, Deming, and Juran.

Crosby

Philip B. Crosby began in industry as a quality inspector and later became vice president of quality at ITT. His main focus has been on top management, and he has attempted to change its attitudes about quality. He believes that as quality improves, overall costs go down and, he says, "quality is free" (Crosby, 1979).

Crosby defines quality as conformance to requirements. In order to meet quality requirements and reduce the cost of quality, he emphasizes prevention, zero defects, and measurement process.

Deming

W. Edwards Deming has been given much of the credit for revolutionizing quality in Japan. However, his influence in the United States was insignificant until the 1980s. He emphasized that organizations need to

change in order to realize significant quality gains and that the responsibility for change rests with management. Although Deming's methods are based on the use of statistics, his 14 points cover far more than the use of statistical techniques.

Juran

Joseph M. Juran has had a major impact on quality, both in Japan and in the United States. As early as the 1940s, Juran argued that quality was achieved through people rather than techniques. He also believed that management is the cause of the majority of quality problems. Juran's approach to improvement revolved around three basic activities: structured annual improvement plans, massive training programs, and top management leadership (Juran, 1989). He said top management in particular needs a good understanding of quality because quality issues extend organization-wide.

TQM gurus discussed above have set principles and directions for U.S. and Japanese corporations and influenced researchers and practitioners around the globe.

The TQM Research

In the 1980s, some researchers have discussed the reasons for the inferior quality of U.S. products and even showed protective attitudes toward superior product quality (Tolchin & Tolchin,1988). Others have recommended TQM approaches such as customer focus, teamwork, continuous improvement, leadership, product quality control, and organizational change (Bhote, 1989;

Cole,1980, 1990; Harmon, 1988;Oliver, 1988) in order to enhance product and service quality. Some conceptual works were also developed to better explain the superior organizational performance that integrated quality into their product or service processes and designs (Garvin,1984,1986,1987; Robinson & Schroeder,1990). In addition, research introduced many case studies of successful or unsuccessful TQM implementations. These studies cover various industries such as automobile (Aldridge, Taylor, & Dale, 1991), textile (Allen & Oakland, 1991), chemical (Chapman, Clarke, & Sloan, 1991), and banking (Dawson & Patrickson, 1991), and education. Although conceptual works and case studies provide key elements of TQM, they cannot provide evidence of TQM effectiveness.

Empirical studies in the 1980s provide comparisons of TQM practices between the U.S. and Japanese organizations (Ebrahimpour, 1985; Garvin, 1986; Imai, 1986). These studies concluded that the Japanese give a very high priority to elements such as top management commitment, long-term relationship with suppliers and customers, continuous and incremental timeframe, while the U.S. firms focus on inspecting quality, short-term relationship with customers and suppliers, and non-incremental timeframe (Imai, 1986).

Various aspects of TQM operations in the U.S. were presented in more recent empirical research. For instance, Modarress and Ansari (1989) surveyed the use of various quality control techniques in U.S. firms.

Ebahimpour and Withers (1992) compared the involvement of assembly workers in the Japanese firms operating in the U.S., and U.S. firms. Empirical research has also focused on the relationship between various quality management elements and performance. For example, Schroeder, Sakakibara, Flynn, and Flynn (1992) compared quality management of Japanese transplants in the U.S. with the U.S. manufacturing plants. Roth and Miller (1992) discussed success factors in manufacturing firms. Anderson et al. (1994) developed the theoretical foundations of quality management practice. They examined Deming's 14 points and deciphered seven major concepts through a Delphi study. Although their approach may not lead to a generic theory of quality management, their work provides important prescriptions of Deming's principles.

To establish theoretical constructs of quality management, researchers need to examine TQM based on literature in quality management, organizational behavior, and general management theories (Ahire, Golhar, & Waller, 1996). Saraph, Benson and Schroeder (1989) reported one of the first empirical efforts to analyze the effect of an organization's quality background on its actual quality performance. They further refined their TQM constructs (Benson, Saraph, & Schroeder, 1991). Although their empirical studies do not analyze relationships among the constructs, they were among the first researchers who took a classical approach (Churchill,1979) to developing a theory.

While many western organizations have adopted TQM, their implementation has not always been successful. The implementation failure has been attributed to unfocused improvement efforts without specific product or process improvement. For instance, training programs without understanding their impact on quality likely end up with the implementation failure (Schaffer & Thomson,1992).

Several elements of the TQM strategies have emerged from reported case studies, conceptual papers and empirical research. For example, various statistical process controls, benchmarking, employee training, and employee involvement programs are among the most commonly applied TQM approaches (Modarress & Ansari,1989; Schroeder et al., 1992). However, organizations often employ interrelated TQM elements separately due to their lack of understandings of TQM philosophy. According to Hackman and Wageman (1995), TQM assumes frequent interactions within and between the organizations:

> Organizations are systems of highly interdependent parts, and the central problems they face invariably cross traditional functional lines. To produce high quality products efficiently, for example, product designers must address manufacturing challenges and trade-offs as part of the design process. (p. 311)

It is important to develop the TQM theory and identify factors that are critical for improving product quality. As Ahire et al. (1996) claim, "the TQM theory is far from being fully developed" (p. 24) and should be cross-examined outside the U.S.-Japan realm.

Purpose of the Study

Western and Japanese researchers identified and claimed that various TQM factors, such as problem-solving environment, communication, reward and clear objectivity, are positively related to work outcomes, such as satisfaction, commitment, and financial measures.

However, we do not know how TQM factors are related to outcomes in developing countries. How does the innovative environment influence satisfaction with work? How do rewards and communication improve organizational commitment? Or, how do the problem-solving tools help groups to achieve better team quality in developing countries?

The objective of this thesis is to empirically investigate the effectiveness of total quality management (TQM) practices in the maquiladora industry. In particular, the study focuses on the problem-solving teams and their work outcomes by analyzing a Japanese owned automobile component manufacturer located in the city of Juarez, Chihuahua, Mexico.

The Maquiladora

In the 1960s the Mexican government developed the Border Industrialization Program (BIP) whereby assembly plants employing Mexican labor could be set up with a duty-free status. The basic requirement for operating these plants was that all materials that went in Mexico had to eventually go back outside Mexico (Stoddard, 1987).

The Japanese organizations were successfully producing with low cost labor. Automobile component manufacturers such as Sumitomo Denso and consumer electronics firms such as Sanyo, Toshiba, and Hitachi have set up large operations in Mexico under the BIP program.

The number of maquiladoras as well as the importance of the maquiladora industry ("production sharing" or "twin plant") along the U.S.-Mexico border has grown over the years. According to Stoddard (1987), the rapidly growing maquiladora industry in northern Mexico border region has attracted the popular media, national and regional politicians, production workers, and scholars from both Mexico and the United States.

There exist many academic works that discuss the maquiladora industry from cultural aspects (Gillespie & Teegen, 1995; Lawrence & Yeh, 1994; Stephens & Greer, 1995). However, the degree of involvement by quality management in particular is not yet well explored. Although a review of relevant literature (Lawrence & Yeh, 1994; McDermott,1994) can provide a background concerning possible problems encountered in TQM, the amount of literature that addresses this issue in the maquiladora is still limited.

Summary of the Chapter

There is a widespread consensus that TQM is a way of managing organizations to achieve customer satisfaction, continuous improvement, and teamwork (Dean & Bowen, 1994; Morrow, 1997) but there is less agreement

as to whether TQM can help organizations to improve their employees' satisfaction and commitment.

This study examines how Mexican workers perceive the importance of TQM on their jobs and workers perceive an increase in satisfaction with job, satisfaction with leader, organizational commitment, and TQM elements are related to performance of quality control circles.

Chapter 2

LITERATURE REVIEW

Deming's 14 Points

Companies have been concerned with the quality of their products and their quality management processes for years. However, only since the 1980s have organizations paid serious attention to the implementation of quality management. TQM has its origins in manufacturing, where statistical quality control measures were first used to reduce product defects. However, as discussed earlier, TQM has spread to include applications in service industries and government organizations.

TQM is neither a program nor a specific tool or technique. Rather, it is an integrated management approach (Dean & Evans, 1994) that assumes "organizations are systems of highly interdependent parts" (Hackman & Wageman, 1995, p. 311).

A review of the literature reveals that TQM encompasses a vast spectrum of topics and perspectives. A number of individuals associated with the TQM movement have been highly respected by practitioners and academicians. Among these, perhaps the one most significant in his TQM philosophical claims has been W. Edwards Deming. The work of Deming is "perhaps most relevant to understanding connections between total quality and work performance and the management of such performance" (Waldman, 1994, p. 512). Deming (1986) summarized his management

philosophy as "14 principles" that will help organizations stay competitive in providing products and services. These include management leadership, statistical process control, driving out fears in the workplace, and removal of barriers between staff areas. Table 1 describes Deming's 14 points.

Some scholars claim that Deming's 14 points are a set of theory. For example, Gartner and Naughton (1988) claim that the 14 points offer "an entirely new paradigm of profound challenges to present-day managerial thinking and behavior" (p. 138). Others view the 14 points as just a statistical process control with an organization-wide change and called it "Theory D" (Luthans & Thompson, 1987).

Deming claimed that the 14 points are principles of transformation for improving the practice of management. They describe "a complex, prescriptive set of interrelated rules of inter- and intraorganizational behavior, codified and communicated in the linguistic form of commands" (Anderson et al., 1994, p. 446).

Generating a Preliminary Set of Concepts

Since Deming introduced his 14 principles (1981,1986), researchers attempted to construct an ubiquitous concept called total quality management. For instance, Saraph and his colleagues (1989) focused and refocused (Benson et al., 1991) management and organizational roles, training, relationships between external and internal groups, process management, and design aspect. Zeitz et al. (1997) emphasized managerial

Table 1

Deming's 14 Principles

Point 1	*Create constancy of purpose for improvement of product and service.* Provide jobs through innovation, research, constant improvement, and maintenance.
Point 2	*Adopt the new philosophy.* Need a new rule in which mistakes and negativism are unacceptable.
Point 3	*Cease dependence on mass inspection.* Improve the process so that the system does not depend on mass inspection.
Point 4	*End the practice of awarding business on the price tag alone.* Seek the best quality in a long-term relationship with a single supplier for any one item.
Point 5	*Improve constantly and forever the system of production and service.*
Point 6	*Institute training.* Employees should receive intelligible instructions from people who are properly trained.
Point 7	*Institute leadership.* The job of a supervisor is not to tell people what to do nor to punish them but to lead.
Point 8	*Drive out fear.* Employees should ask questions or to take a position without feeling fear even if they do not understand what their job is or what is right or wrong.
Point 9	*Break down barriers between staff areas.* Units should work together as a team so that they can solve problems.
Point 10	*Eliminate slogans, exhortations and targets for the work force.* Let workers formulate their own slogans because slogans set forth by top management never helped anybody do a good job.
Point 11	*Eliminate numerical quotas.* They take into account only high costs, not quality or methods.
Point 12	*Remove barriers to pride of workmanship.* Remove misguided supervisors, faulty equipment and defective materials.
Point 13	*Institute a vigorous program of education and retraining.* Workers and management should be educated in teamwork and statistical techniques.
Point 14	*Take action to accomplish the transformation.* A special top management team with a clear plan of action is required in order to carry out the quality mission.

Adapted and modified from Mary Walton, *Deming management at work* (New York: The Berkley Publishing Group, 1991).

and systematic procedure of organizations, and cultural or climate factors. Morrow (1997) applied teamwork–continuous improvement–customer focus framework set by Dean and Bowen (1994). It seems that the selection of TQM factors is contingent upon the nature of the study and environment of organizations.

Masaaki Imai (1986), a Japanese TQM guru, presented his framework in his book "*Kaizen.*" *Kaizen* is a Japanese word for an ongoing improvement that involves everyone in the organization (Imai, 1986). Some of the TQM principles that Imai emphasizes throughout the book include the roles of leader and members, communication, morale, skills and knowledge, problem solving environment, and labor-management relations.

Based on Imai's (1986) *Kaizen*, the role of leader, problem solving environment, communication, and rewards were selected for the study. An *a priori* factor, TQM tools, was also added in the study. Table 2 summarizes these 5 TQM concepts and their brief descriptions.

Three traditional work outcomes (commitment, satisfaction with work, and satisfaction with leader) were selected as dependent variables in the study. In addition to these work outcomes, the TQM manager provided performance of Quality Control Circles (QCCs). QCCs are small group of employees and their leader from the same work area who voluntarily meet on a regular basis to study quality control and productivity improvement techniques. QCCs members apply these techniques to identify and solve

Table 2

Critical Factors of Quality Management

Critical Factors of Quality Management	Descriptions of Critical Factors
1. Role of leader	Acceptance of quality responsibility by leaders. Participation by leader in quality improvement efforts. Specificity of quality goals.
2. Problem solving environment	Encouragement of making suggestions by members. Encouragement of trying new, better, and creative ways of doing the job.
3. Rewards	Monetary or verbal reward for members who do good works. Recognition of good works.
4. Communication	Effective communication between and within group members. Good communication between members and leader.
5. TQM tools	Usage of TQM tools to improve the situation. Seven traditional tools and other tools used by groups.

work-related problems, to present their solutions to management for approval, and to monitor the implementation of these solutions to ensure that they work (Imai, 1986).

Developing the Conceptual Relationships

Imai's concepts provide the building blocks of the theory in the study (Whetten, 1989). To establish how the building blocks are interconnected, the relations diagram was applied subsequently (Mizuno, 1988). This diagram specifies the relational linkages among the conceptual building blocks.

In order to specify the relational linkages among the set of 9 factors, 5 TQM concepts and 4 work outcomes, the relations diagram was employed. Mizuno (1988, p. 87) described the relations diagram as a tool that "clarifies

intertwined causal relationships in complex problems or situations in order to find appropriate solutions." Figure 1 illustrates the conceptual relationships. The figure shows the structure for the literature review.

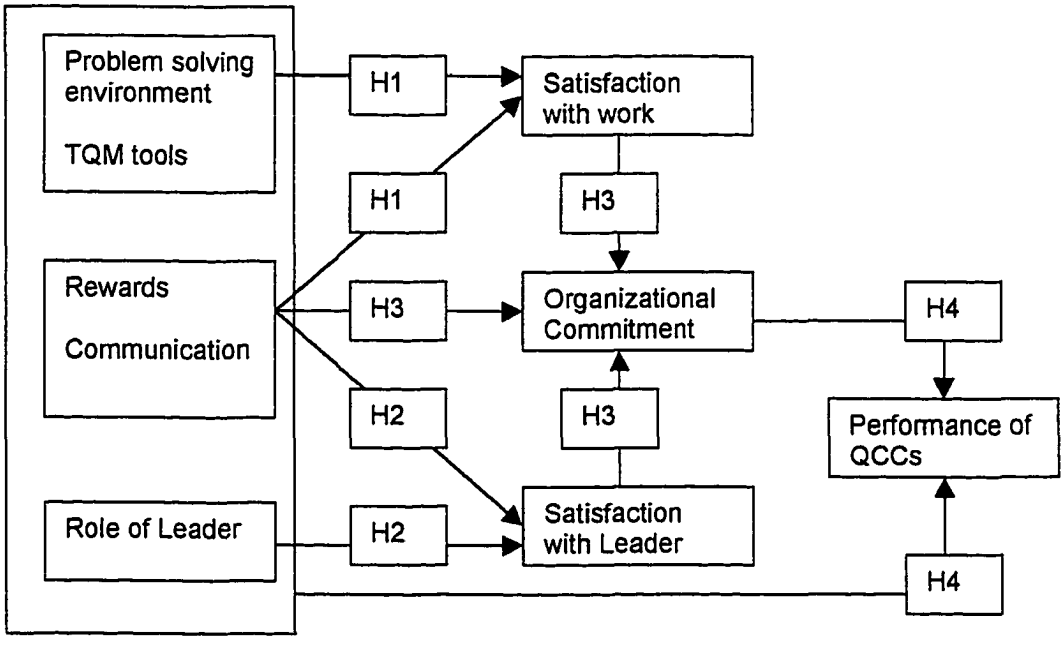


Figure 1. Hypothesized Relations

Conceptual Relationships in Existing Literature

To establish the why the building blocks are interconnected, the theory was further mapped onto existing relevant knowledge in the literature. Insights from this process should help to explicate the reasoning process that governed the construction of this theory and should lend credibility to the proposed theoretical relationships. The purpose is to demonstrate supporting or conflicting viewpoints rather than to prove or disconfirm the relationships in the proposed model.

Satisfaction with Work

Problem Solving Environment. Problem solving environment refers to the climate that supports new ideas concerning work methods as well as products. Whereas Imai (1986) explicitly contrasts innovation and "continuous improvement," (p. 24) most researchers agree that "any climate orientation toward innovation is consistent with, and conceptually overlaps, continuous improvement" (Zeitz et al., 1997, p. 420). Basadur (1992) reports that Japanese employee suggestion systems emphasize a large number of small ideas, and everyone participates. His findings indicate that the Japanese companies have an infrastructure that ensures motivation, job satisfaction, and group interaction. Many companies are now realizing that playful creativity and meaningful work can combine to create organizations where people not only love to come to work, but also obtain superior results (Berg,1995). The innovative and fearless environment (Deming, 1986) creates the perception that a job allows for fulfillment of an individual's important work values (Locke, 1984). The fulfillment of work value, or simply known as value attainment, is found to influence job satisfaction (Locke, 1984).

TQM Tools. QCC requires ongoing improvement involving members of circles (Imai, 1986). Tools are essential for implementing *Kaizen*-based activities such as QCC. A wide variety of statistical tools are available for members to accomplish work; make meaningful measurements; display; and

analyze. If members of QCC see positive changes, or incremental improvement, in the process, they will feel the sensation of satisfaction (Pinder, 1998) from their work. Hackman and Oldham (1980) theorized that the more that a job requires an employee to use a wide range of skills, abilities, or knowledge, the more employees feel that their work is meaningful and that they are responsible for work outcomes and responsible for knowing how those outcomes affect others. As work becomes more motivating, employees tend to feel job satisfaction.

Brook and Brook (1989) explored the relationship between work and nonwork activities for a group of employed professional and skilled trades people in New Zealand. Their results reaffirmed that job satisfaction is associated with the chance to use abilities and skills and with recognition for work well done.

Rewards. Work satisfaction is an emotional response resulting from the interaction of work rewards and work values (Kalleberg,1977; Katzell,1979; Locke,1969; Morse, 1953; Vroom,1964). Work rewards refer to the intrinsic and extrinsic benefits that workers receive from their jobs. McDermott (1994) reports that monetary or verbal reward influence on job satisfaction in Mexico. QCCs use the form of team reward. Team reward systems solve the problems caused by individual competitive behavior. It is claimed that team reward systems emphasize cooperation, the sharing of information, knowledge, and expertise (Milkovich & Newman, 1993).

Communication. Communication can increase responsiveness and understanding among organizational members. It is reported that communication enhances coordination of workflow (House & Rizzo, 1972) and creates trust (Jones & James, 1979) among the group members. An individual who is highly involved with interaction with others tries to integrate thoughts, feelings, and both nonverbal and verbal behaviors when responding to others (Cegala et al., 1982).

Studies examining the relationship between communication and job satisfaction have reported their significant positive relationships. Roberts and O'Reilly (1979) studied communication roles and job satisfaction. They found that the more centralized workers are in an organizational network, the higher their job satisfaction. Bacon (1980) reported that there is a significant positive relationship between ambiguity in job-related messages and job satisfaction. Pincus (1985) found a positive relationship between the quality of organizational communication and job satisfaction.

The management literature offers a number of reasons to believe that a relationship exists between elements of TQM and satisfaction with work. More specifically, problem-solving or innovative environment, use of TQM tools, reward, and communication are likely to relate to perceived satisfaction with work. Therefore, the following research hypotheses will be tested.

H1a: The greater the perceived level of problem-solving environment, the greater the perceived job satisfaction.

H1b: The greater the perceived level of extent use of TQM tools, the greater the perceived job satisfaction.

H1c: The greater the perceived level of rewards, the greater the perceived job satisfaction.

H1d: The greater the perceived amount of communication, the greater the perceived job satisfaction.

Satisfaction with Leader

Rewards. Reward systems have the most positive effect on turnover and absenteeism rates in Mexico (McDermott,1994). Cooperation, joint efforts, the sharing of information, knowledge, and expertise as results of team reward systems (Milkovich & Newman, 1993) enhance mutual understanding between members and leaders. Thus, it is expected that recognition of good work, financial or verbal, should increase not only satisfaction with work, but also satisfaction with leaders.

Communication. Researchers found that communication enhances social relations (Pritchard & Karasick, 1973), creates openness (Downey, Hellriegel, & Slocum, 1975) and friendliness and warm environment (Jones & James, 1979). They also found that subordinates' perceptions of openness are positively related to their job satisfaction, and in particular their satisfaction with supervision (Wheeless, Wheeless, & Howard, 1984).

Berman and Hellweb (1989) studied the relationship between perceptions of supervisor communication competence and supervisor

satisfaction as a result of quality circle involvement. They found that a subordinate's perception of his or her supervisor's encoding competence was found to be a stronger predictor of perceived supervisor satisfaction.

Researchers have emphasized the importance of employee communication with supervisor in relationship to satisfaction with supervisor has been emphasized (Buller, Moore, Luttrell, & Furr, 1981; Falcione et al., 1977; Richmond & McCroskey, 1979). Communication satisfaction with supervisor and supervisor receptivity to information seem to be perceived important for employees (Wheeless et al., 1984).

In sum, communication experts agree that communication satisfaction with supervisor is directly related to the satisfaction with supervisor (Smith et al., 1969).

Role of Leader. Ishikawa (1985) claimed that challenging goals are appropriate as long as they are about solving particular problems and are established in such a way as to allow cooperation among functions. Group based activities, such as QCCs, encourage members to set their own themes or objectives.

However, in Mexico, each person's task, responsibility and authority within an organization are very well defined. Most decisions are made at the top of the organization (Kras, 1989). Therefore, it is reasonable to assume that workers depend on leader's skills, abilities, and knowledge in order to improve the work process and design.

Based on the above discussion, the following hypotheses are proposed.

H2a: The greater the perceived level of rewards, the greater the perceived satisfaction with their leader.

H2b: The greater the perceived amount of communication, the greater the perceived satisfaction with their leader.

H2c: The greater the perceived level of leader's involvement in quality improvement, the greater the perceived satisfaction with their leader.

Organizational Commitment

Rewards. Organizational commitment is largely a function of work rewards. Work rewards refer to the intrinsic and extrinsic benefits that workers receive from their jobs (Herzberg,1966). Katz and Van Maanan (1977) have developed a three-component model of work rewards: task rewards, social rewards, and organizational rewards. Task rewards are derived from the content of the task itself and include such factors as interesting and challenging work, self-direction and responsibility, variety, and opportunities to use one's skills and abilities. Social rewards are intrinsic in nature and are gained by interacting with others on the job. Organizational rewards refer to extrinsic rewards provided by the organization in order to motivate job performance. They are tangible and visible to others. They include pay, promotions, and the like.

For the most part, researchers agree that work rewards are the key determinates of organizational commitment (Angle, 1983; Mowday et al., 1982; Steers,1977). Management should make sure that employees are rewarded equitably in the workplace because organizational commitment is highly dependent upon perceived fairness in distributing rewards (Wallace, 1995). Reward systems are considered one of the most effective ways to increase attendance rate in Mexico (McDermott, 1994).

Communication. Over the past two decades, the constructs of communication, satisfaction and organizational commitment have been important variables of interest to organizational communication researchers (Clampitt & Downs,1993; Cook & Wall, 1980; Mowday et al., 1982; Putti, Aryee, & Phua, 1990; Reichers, 1985).

Research demonstrated a relationship between communication satisfaction and organizational commitment in Singapore (Putti, Aryee, & Phua, 1990), in the U.S. (Potvin, 1991), in Australia (Downs, 1991). In a more recent study on cross-cultural comparisons of relationships between organizational commitment and organizational communication, Downs et al. (1995) compared results obtained in American, Australian, and Guatemalan organizations and demonstrated the similar results for three countries.

More recently, Vanora (1996) empirically studies the relationship between communication and organizational commitment in Central American and found that there was a strong positive relationship between

communication satisfaction and employees' organizational commitment. These cross-cultural studies indicate that supervisory communication, personal feedback, and communication climate are the strongest communication predictors of organizational commitment.

Satisfaction with Work. While the construct of organizational commitment has received a great deal of attention (Allen & Meyer, 1990; Meyer, Allen, & Gellatly, 1990; Meyer, Allen, & Smith, 1993; Meyer & Allen, 1997), most of this attention has been directed towards identifying the consequences of having committed employees. Despite the large number of studies that have investigated the determinants of organizational commitment, there is little agreement regarding the relative impact of the various individual and organizational factors on organizational commitment (Angle, 1983; Bateman & Strasser, 1984; Reichers,1985).

Research suggest that commitment is positively associated with motivation and involvement (Stumpf & Hartman, 1984) and job performance (Herzberg, 1966). Some studies suggest that commitment is negatively associated with absenteeism (Angle & Perry, 1981) and turnover (Cotton & Tuttle, 1986) and work rewards (Caldwell, Chatman, & O'Reilly, 1990). Job satisfaction and dissatisfaction are assumed to be much better predictors of attendance, tardiness, and turnover than they are of performance levels (Pinder,1998). Researchers (Kipnis et al., 1984) found strong positive relationship between job satisfaction and organizational commitment via

rationality. Despite these inconsistent study results, it is reasonable to assume that workers who are not satisfied with their job are less likely to have organizational commitment.

Satisfaction with Leader. Sager and Johnston (1989) examined relationships between a set of antecedents and organizational commitment and found workers' satisfaction with their manager was positively related to organizational commitment. Supervisory interventions generally are recommended to reduce turnover (Jablin, 1987; Krackhardt et al, 1981; Steers & Porter, 1983). However, Lance (1991) found that leader facilitation and support, operationalized in terms of influence, trust, feedback, and structure, were not significantly related to voluntary turnover. Despite the mixed results, most models of the turnover process indirectly link communication and turnover intentions (Jablin, 1987; Lance, 1991).

These relationships are reflected in the following hypotheses:

H3a: The greater the perceived level of rewards, the greater the perceived organizational commitment.

H3b: The greater the perceived amount of communication, the greater the perceived organizational commitment.

H3c: The greater the perceived level of job satisfaction, the greater the perceived organizational commitment.

H3d: The greater the perceived level of satisfaction with leader, the greater the perceived organizational commitment.

Performance of QCCs

Organizational Commitment. Several researchers have examined organizational citizenship behavior (Allen & Rush, 1998; Mowday, Porter, & Steers, 1982). Such behaviors quite consistently correlate positively with organizational commitment. Morrison (1994) found that employees with strong organizational commitment defined their jobs more broadly and were more likely to engage in organizational citizenship behaviors. Committed employees are more likely to engage in organizational citizenship behavior, or going above and beyond the call of duty to help their company, and are less likely to quit (Engardio, 1994).

Meyer et al. (1993) found that affective commitment, or positive beliefs and attitudes about the organization, was correlated with performance. Managers are advised to increase job satisfaction in order to elicit higher levels of commitment (Mathieu & Zajac,1990). In turn, higher commitment can facilitate higher productivity. Furthermore, organizational commitment is assumed to relate to performance "under the assumption that committed employees would expend greater effort on the job" (Steers, 1977). Although the relationship was weak, Steers (1977) showed positive association between commitment and performance measures for hospital employees.

Problem Solving Environment. Deming (1986) emphasizes the importance to create a problem solving environment in organizations in his 14 points. First, he suggests creation of constancy of purpose for improvement of

product and service. According to Walton (1991), Deming defines a company's new role, "Rather than to make money, it is to stay in business and provide jobs through innovation, research, constant improvement and maintenance" (p. 17).

Second, Deming suggests organizations to improve constantly and forever the system of production and service. Continuous improvement is "often undramatic and suble, and its results are seldom immediately visible...with effects that are felt over the long run" (Imai, 1986, pp. 23-29). Third, Deming recommends organizations to drive out fear from the workplace.

> Many employees are afraid to ask questions or to take a position, even when they do not understand what their job is or what is right or wrong. They will continue to do things the wrong way, or not do them at all. The economic losses from fear are appalling. To assure better quality and productivity, it is necessary that people feel secure. (Walton, 1991, p. 18)

Although innovation process through continuous improvement in TQM is slow, gradual, and often invisible (Imai, 1986), employees' ongoing efforts toward their goal accomplishment are expected to result in better group or unit performance.

TQM Tools. The prerequisite for motivating workers is that "they have the ability, skills, and knowledge to accomplish an assigned task" (Costley et al., 1994, p. 348). Previous research has found that the knowledge, skills, and abilities are important components for conflict resolution, collaborative

problem solving, communication, goal setting and performance management, and planning and task coordination (Stevens & Campion, 1999). With regard to specific problem solving tools, Kano (1993) reported that "the most popular techniques are the Pareto diagram, cause and effect diagram, and the histogram" (p. 19) to improve quality around the world. He explains that a remarkable number of problems can be solved with simple methods such as the seven quality control tools. If employees have skills to perform the assigned work, they can improve process and product.

Juran (1989), Deming (1986), and Ishikawa (1985) agree that the use of statistical tools to monitor and analyze work processes. A wide variety of statistical tools are available to identify the points of highest leverage for quality improvement, to evaluate alternative solutions to identified problems, and to document the results of process changes in order to achieve high organizational performance.

Communication. A considerable amount of research suggests that the leader's performance feedback about followers' competence motivates followers and directs them toward appropriate goal-directed activity. Goal setting theory (Locke et al., 1981) suggests that goals and intentions regulate our actions. If goals determine effort, it follows that higher or harder goals will result in higher levels of performance than will easy goals. The theory also suggests that goals should be specific. That is, the impact of communication on performance may be mediated by the leader's ability to provide specific

and difficult but attainable goals. However, it is generally accepted that the impact of feedback on performance is virtually always positive (Jacoby et al., 1984).

Whether communication is verbal or non-verbal, and whether it is personal or impersonal, managerial decisions and organizational policies are conveyed by effective communication and it seems to be a key to organizational success.

Rewards. One very clear trend in today's workplace is the move toward teams. According to Lawler (1981, p. 224), reward systems "can play a role in increasing individuals' motivation to perform effectively, improving productivity in organization." Team-based reward is an organizational incentive system given to teams for their collective results. This reward system highlights an important distinction between individual behavior and team results. In other words, it takes team players to get team results.

The biggest single barrier to effective team-based reward is cultural, especially in highly individualistic cultures such as the United States (Trompenaars, 1994). Team-based reward is a threat to the cultural tradition of putting the individual above the group.

Another culturally rooted problem is a general lack of teamwork skills. Interviews with managers in Mexico showed that between 40 to 50% of workforce in the maquiladora have only elementary education or lower and their skill levels are generally low. On the other hand, members of high-

performance teams are generally skilled communicators, conflict handlers, and negotiators. Employees accustomed to being paid for personal achievements tend to resent having their reward dependent upon others' performance and problems.

However, Mexican culture has been described as collectivism (Hofstede,1980). Although Kolland (1990) implies that the family is the important group within Mexican culture, not the work group, strong loyalty is still directed toward the worker's boss. If Mexican workers perceive their co-workers as their extended family, they would show their strong loyalty and go extra miles for the team goals and performance.

Role of Leader. The TQM domain of leadership is covered extensively in the management literature. TQM gurus emphasize that top management leadership is critical for organizational success (Deming, 1986; Juran, 1989). However, as Dean and Bowen (1994) point out, Deming's perspective suggests that "system factors matter more than individual differences in explaining worker effectiveness" (p. 399). This is congruent to Pfeffer's (1977) argument that leadership is irrelevant to most organizational outcomes. Dean and Bowen (1994) claim:

> [TQM], however, appears to assign far less importance to leadership's role further down the hierarchy. In this case, [TQM] has a "substitutes-for-leadership" flavor, in which various characteristics of subordinates, tasks, and organizations take the place of many leadership behaviors. (p. 399)

However, TQM is a situation-based management approach (Pfeffer,1977). In the workplace where 40 to 50% of workforce have only elementary education or lower, the leadership at the low level of the organizational hierarchy is very important.

As implied earlier, Mexican employees with low skills, abilities, and knowledge tend to depend upon others' performance. It is very reasonable to assume that the performance of group-based activities in the maquiladora is dependent upon the leader's clear objectives and attitudes toward quality performance. If the leader fails to play his role, unit members will head off in the wrong direction or go about their work in inefficient or inappropriate ways, because they are not entirely clear about what they are supposed to do.

Consistent with the preceding discussion, the following hypotheses are offered. With regard to employees in Mexico,

H4a: The greater the perceived level of organizational commitment, the higher the performance of QCCs.

H4b: The greater the perceived level of problem-solving environment, the higher the performance of QCCs.

H4c: The greater the perceived level of extent use of TQM tools, the higher the performance of QCCs.

H4d: The greater the perceived amount of communication, the higher the performance of QCCs.

H4e: The greater the perceived level of rewards, the higher the performance of QCCs.

H4f: The greater the perceived level of leader's involvement in quality management, the higher the performance of QCCs.

Table 3 summarizes hypotheses in the study.

Table 3

List of Hypotheses in the Study

H1a: The greater the perceived level of problem-solving environment, the greater the perceived job satisfaction.

H1b: The greater the perceived level of extent use of TQM tools, the greater the perceived job satisfaction.

H1c: The greater the perceived level of rewards, the greater the perceived job satisfaction.

H1d: The greater the perceived amount of communication, the greater the perceived job satisfaction.

H2a: The greater the perceived level of rewards, the greater the perceived satisfaction with their leader.

H2b: The greater the perceived amount of communication, the greater the perceived satisfaction with their leader.

H2c: The greater the perceived level of leader's involvement in quality management, the greater the perceived satisfaction with their leader.

H3a: The greater the perceived level of rewards, the greater the perceived organizational commitment.

H3b: The greater the perceived amount of communication, the greater the perceived organizational commitment.

H3c: The greater the perceived level of job satisfaction, the greater the perceived organizational commitment.

H3d: The greater the perceived level of satisfaction with leader, the greater the perceived organizational commitment.

H4a: The greater the perceived level of organizational commitment, the higher the performance of QCCs.

H4b: The greater the perceived level of problem-solving environment, the higher the performance of QCCs.

Table 3 continued

H4c: The greater the perceived level of extent use of TQM tools, the higher the performance of QCCs.
H4d: The greater the perceived amount of communication, the higher the performance of QCCs.
H4e: The greater the perceived level of rewards, the higher the performance of QCCs.
H4f: The greater the perceived level of leader's involvement in quality management, the higher the performance of QCCs.

Chapter 3

METHODOLOGY

Sample

The Organization

The organization studied manufactures wire harnesses for automobiles and has 18 factories in the state of Chihuahua, Mexico, that employs approximately 10,000 people. The Japanese owned manufacturer established factories in Mexico in 1982 and has become one of the leading wiring harness makers in Mexico.

The manufacturer plans, controls, and documents activities affecting quality in order to register for ISO 9000, a part of the International Organization for Standardization that focuses on a quality system standard (Johnson, 1993). The ISO 9000 standard requires that every business activity affecting quality be conducted in a three-part, never ending cycle: planning, control, and documentation. In order to compete and survive in the automobile component industry, the manufacturer registered its first ISO 9000 for one of the factories in 1996. This organization met the criteria of having visible TQM activities such as quality planning, controlling, and continuous quality improvement activities. Table 4 describes brief explanations of ISO 9000 requirements (Johnson, 1993, p. 6).

Table 4

ISO 9000 Requirements

• Activities affecting quality must be planned to ensure that goals, authority, and responsibility are defined and understood.
• Activities affecting quality must be controlled to ensure that specified requirements (at all levels) are met, problems are anticipated and averted, and corrective actions are planned and carried out.
• Activities affecting quality must be documented to ensure understanding of quality objectives and methods, smooth interaction within the organization, feedback for the planning cycle, and objective evidence of quality system performance for those who require it, such as customers or third-party assessors.

Two vice presidents, one Mexican national and one Japanese national, support a Japanese president who has ultimate responsibilities for all 18 factories. A Mexican manager is assigned as a TQM regional coordinator and he is responsible for TQM development and training activities for all 18 factories. The Mexican manager has been working for the company for more than 10 years and is very knowledgeable in quality management.

Factories located in Juarez, Chihuahua were selected for the study because their physical locations were closer to the United States than other factories.

Demographic Characteristics

The participants in this study were employees from divisions of operations, maintenance and engineering in the six factories in Juarez. A total of 155 employees in six factories in Cd. Juarez participated in the study. All

155 participants completed questionnaires. Survey administrators checked to see if participants skipped any items as they handed their questionnaires.

In general, participants were young and had low level of education. Age breakdown of the sample is 25 years or younger account for 57.9%, while 26 years or older represent 42.1%. The education profile showed that 75.2% had a junior high school or lower degree, and only 24.8% had some high school experience or higher than high school degree. The age and education demographic characteristics reflected organization's strategy of labor cost reduction.

It is claimed that "many Mexican employers continue to favor males in their hiring practices" (Stephens & Greer, 1995, p. 50). However, almost the same number of male and female participated in the study: 46.5% were male and 53.5% were female.

Quality control circles activities were emphasized in the organization. Quality control circle (QCC) members accounted for 61.9% of participants, while non-QCC members accounted for 38.1% of the participants.

Since its first ISO 9000 registration in 1996, the organization emphasized the importance of the ISO 9000 qualification. Employees at plants that were qualified or preparing for ISO 9000 accounted for 64.5% of participants and employees at plants that were not preparing for ISO 9000 accounted for 35.5% of participants.

48.7% of participants had been with the organization for less than 2 years, while 51.3% had been working more than 2 years. This demographic characteristic reflected the organization's high job turnover ratio: 20% *a month*. Table 5 describes sample characteristics.

Procedure

The study involved developing a scale to measure total quality management (TQM) factors and investigating the effect of those factors on employee outcomes in the maquiladora.

The first trip to the organization in the study in May 15, 1999. A meeting was held with the president of the organization and a Japanese general manager to explain the research plan based on the Dean and Bowen's TQM framework (teamwork, continuous improvement, and customer focus). After the meeting, the Japanese general manager assigned the Mexican TQM manager to support the study.

Using Imai's (1986) framework as a basis for subsequent theory development, the second meeting was held with a corporate TQM manager (in June 16, 1999) to aid in the preliminary identification and definition of TQM concepts. The choice of the framework was appropriate because the TQM manager used Imai's *Kaizen* to enhance quality management in the organization. The manager agreed to the study of TQM elements and their consequence in the organization. During the second meeting, the nature and purpose of the study was explained verbally and in writing. The TQM

Table 5

Sample Characteristics

Characteristics	Frequency	Percent	Cumulative percent
Age			
< 20 years	34	22.4	22.4
21-25 years	54	35.5	57.9
26-30 years	25	16.4	74.3
31-35 years	16	10.5	84.9
36-40 years	12	7.9	92.8
> 41 years	11	7.3	100.0
Gender			
Male	72	46.5	46.5
Female	83	53.5	100.0
Education			
Low	115	75.2	75.2
High	38	24.8	100.0
Plant			
Qualified or preparing for ISO 9000	100	64.5	64.5
Not preparing For ISO 9000	55	35.5	100.0
Quality Control Circles			
Member	96	61.9	61.9
Non-member	59	38.1	100.0
Organizational Tenure			
< 1 year	21	13.6	13.6
1-2 years	33	21.4	35.1
2-3 years	13	8.4	43.5
3-4 years	23	14.9	58.4
> 4 years	64	45.5	100.0

manager explained the TQM activities from policy deployment to quality circle activities.

Based on Imai's *Kaizen* and the two meetings, the following 8 critical factors were identified: role of leader, communication, morale, knowledge/skill/ability, problem solving environment, labor-management relation, training, and rewards. One variable was added to measure the extent to which the quality improvement tools were used. In the third meeting held in July 30, these variables and questionnaire items that were developed from existing literature were explained. The manager agreed to pretest the scale in the factory located outside Juarez, Chihuahua. Procedures to administer a pretest were determined. For instance, a leader of the work unit or group would be asked to direct members to fill out a questionnaire in a designated room. The TQM manager would explain the purpose of the study and give instructions to participants. The pictures of TQM tools would be prepared to aid participants. The target number of pretest participants was set as 100.

A pretest was conducted in August 5, 1999. It took 5 hours to collect 70 questionnaires. The results were coded and analyzed using factor analysis to check dimensions. Not all 8 concepts from the meetings were perfectly recognized in the pretest. Only the following 4 factors were identified by the factor analysis: role of leader, problem solving environment, communication, and rewards. An *a priori* factor, TQM tools, was added in the study.

Three traditional work outcomes were measured: organizational commitment, satisfaction with work, and satisfaction with leader. In addition to these work outcomes, the TQM manager provided performance of quality control circles (QCCs). Performance of QCCs was measured by the company internal report in which an assigned person evaluated progess of his or her QCCs activities based on 13 steps.

In the pretest, some participants took more than 1 hour to complete the questionnaire. It was learned that 50% of participants had the education level of elementary or lower. The TQM manager mentioned that some words were confusing to workers and suggested the revisions of questionnaires. The TQM manager carefully revised the Spanish questionnaire used in the pretest so that plant workers could understand phrases better. This was possible because the TQM supported participants during the pretest and understood very well what items should be revised.

Prior to data collection, survey administration, and the scheduling for data collection were discussed by the phone conversation. It was determined that the purpose of the study and administrative procedure of the survey would be explained to leaders or supervisors of each group or section prior to the survey. It was also determined that verbal and pictorial instructions would be given to participants.

Data was collected in September,1999. In 5 of the 6 plants, the surveys were conducted during the regular pay time. In one plant, the survey

was conducted outside the regular pay time to avoid reduction in productivity. The plant manager paid participants for their overtime work.

To complete the questionnaire, a leader asked group members to go to a designated room or area to fill it out. Between 5 and 10 members filled out the questionnaire at a time. Since the education level of participants was expected to be low, two or three facilitators, including the TQM manager, supported participants in order to clarify wording.

The TQM manager or a corporate level manager explained the purpose of the study to participants. Due to employees' lack of experience in responding to a questionnaires, careful verbal and pictorial instructions were given to participants. Pictures of TQM tools were also posted on the wall to help participants to correctly match tools with their names. Table 6 describes instructions and Appendix A presents pictures of TQM tools used to aid participants.

Table 6

Instructions Given to Participants

Answer all items.
Do not check more than one box for each item.
Check the box, not the words.
Ask any questions to facilitators, not to neighbors.
Answer honestly.

Upon completion, members reported to their leader. Then the leader asked the next member to go to the designated area to fill out the survey. 155 workers from 6 factories participated and completed the survey in the study. Table 7 summarizes events occurred during the meetings.

Table 7

Meetings with the TQM Manager

Date	Events
May 15, 1999	First visit to the organization. 1 hour meeting with the president and general manager. The general manager appointed a TQM manager to support the study.
June 16, 1999	Meeting with the TQM manager. The TQM manager overviewed TQM activities in the organization. Discussions were based on Imai's *Kaizen*. The TQM manager was studying Imai's *Kaizen* at that time. The TQM manager was trying to improve quality control circles activities in the organizations.
July 1, 1999	Meeting with the TQM manager. Questionnaire items that were developed from existing literature were explained. The manager agreed to pretest the scale in the factory located outside Juarez, Chihuahua.
July 30, 1999	Meeting with the TQM manager. Procedures to administer pretest were decided.
August 5, 1999	Pretest was conducted. It took 5 hours to collect 70 responses. The results were coded and analyzed using factor analysis to check dimensions. Modifications were made to improve the scale. It was learned that about 50% of participants in the pretest had only elementary education or lower.
September 7, 8, and 9, 1999	Data for the study was collected in 6 factories. 155 workers participated and completed the survey in the study.

Questionnaire Development

The 50-item questionnaire contains scales to measure five dimensions of TQM (role of leader, problem solving environment, rewards, communication, and TQM tools), and four outcomes (commitment, satisfaction with work, satisfaction with a leader, and performance of QCCs). The development of the scales to measure TQM variables and outcomes was based on the classical test theory proposed by Churchill (1979) and its application by Saraph et al. (1989). Figure 2 illustrates the scale development procedure.

Step 1 describes the literature review. Deming's (1986) work connect the concept of total quality and managerial perspectives (Waldman, 1994). For this thesis, conceptual and empirical studies that were based on Deming's work were reviewed.

Step 2 describes the identification of critical factors of quality management. Imai's (1986) *Kaizen* was used as a basis for the identification of critical factors of quality management. His teachings overlap with Deming's principles. The selection was made because Imai is a Japanese TQM guru and the organization of this thesis was a Japanese-owned manufacturer.

Step 3 describes the selection of specific quality management items that represent and measure critical quality management factors. Existing scales developed by Hunt (1992), Zeitz et al. (1997), Saraph et al. (1989) were used to measure quality management factors.

Step 4 describes a pretest of the instrument. Because existing scales were either early attempts in developing quality management construct or scales not examined empirically, this process was important. A pretest was conducted on a separate sample of line workers in the organization.

Step 5 shows finalization of the measurement items. Through the pretest, it was learned that revisions of items were needed to clarify the meaning of questionnaire items for respondents. This process was important in order to insure that the questionnaire was comprehensible to participants (Brislin,1980).

Step 6 describes data collection. The finalized scale was used for the data collection. 155 participants from 6 plants in Juarez completed the survey in the study. The TQM manager and other corporate managers supported the data collection.

In Step 7, items were examined if they were properly assigned to a factor. Items that correlated highly with more than one factor were dropped from the analysis. Also, items that did not correlate with any factors were dropped from the analysis.

The final step involved evaluating the validity of the measures and the measurement scale as a whole. The results of steps 7, and 8 will be discussed in the Chapter 4. Figure 2 illustrates the scale development procedure.

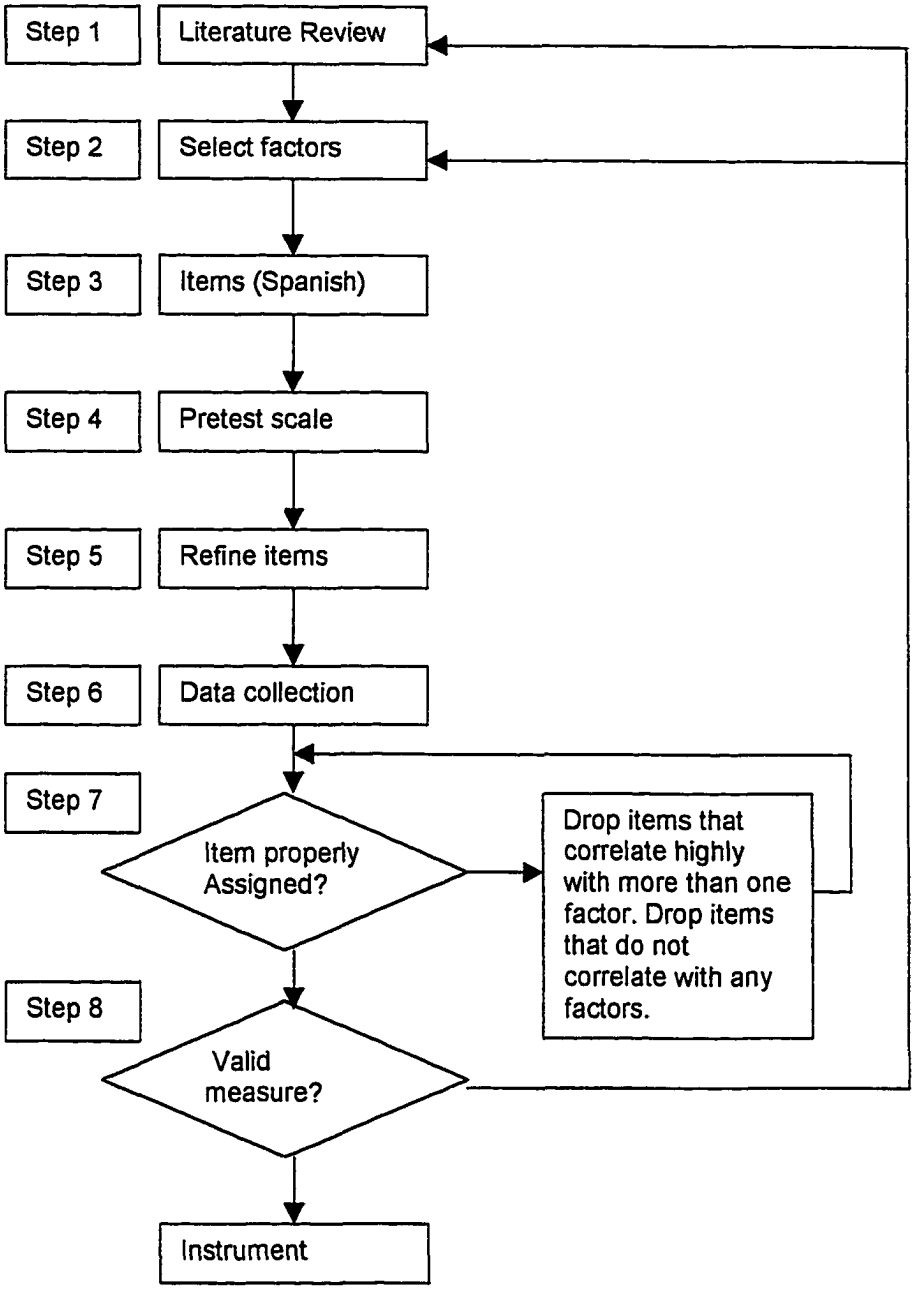


Figure 2. Scale Development Procedure

Independent Variables

The scope of TQM activities was measured with questionnaire items that asked questions about problem solving environment, the extent to use TQM tools, communication, rewards, and role of leader. The factor and number of items for these scales were chosen with the same considerations as to questionnaire length and relevancy to the environment, leading to the shortened versions of existing scales for most measures. The measures are discussed below and reliabilities are noted in Table 8.

Table 8

Reliability of Independent Variables

Independent Variables	Previous Research	Reliability coefficent α In previous research	Reliability coefficent α In the pretest
Problem solving environment	Hunt (1992)	Not tested.	.703
Rewards	Hunt (1992)	Not tested.	.733
Communication	Zeitz et al. (1997) Hunt (1992)	.822 Not tested.	.650
TQM Tools	Not tested.	Not tested.	.830
Role of leader	Saraph et al., (1989) Hunt (1992)	.94 Not tested.	.797

Problem Solving Environment. Problem solving environment was measured using four items from Innovation subscale developed by Zeitz et al. (1997). Five Innovative items that loaded under Innovation were selected and modified from their scale. This dimension describes creative and flexible work

environment. The following 4 items were included in the dimension: "Members are encouraged to make suggestions for improvements in our work," "People in my team are encouraged to try new and better ways of doing the job," "Creativity is actively encouraged in this group," and "People in my team stay to the old, established ways of doing the work." One item in Zeitz's (1997) scale "Innovators are the people who get rewarded in this organization" was not included in the study because of it overlaps with the rewards dimension. The scales used a 5 point Likert-type response format with the following response categories to measure the frequency of the behavior: Never, Seldom, Sometimes, Usually, and Always.

TQM Tools. The use of TQM tools were measured using ten items. Items are stated as "My team uses (name of TQM tool) to improve our work." In addition to seven basic tools (Pareto Chat, Histogram, Flow Chart, Run Chart, Control Chart, Cause-and-Effect Diagram, and Scatter Diagram), Brainstorm, Checksheet, and Gantt Chart were included to reflect the use of tools in the organization. The scales used a 5 point Likert-type response format with the following response categories to measure the frequency of the behavior: Never, Seldom, Sometimes, Usually, and Always. Descriptions of TQM tools are found in Table 9.

Table 9

Descriptions of TQM Tools

TQM Tools	Descriptions
Cause-and-effect Diagram	It identifies all of the factors thought to affect a problem or a desired outcome. Causes of a specific problem are grouped into a fishbone shaped diagram.
Flow Chart	It provides an overview of how a system or process works by indicating the inputs, operations, and outputs of the process.
Run Chart	It represents the results of a process over time or in the sequence the items were produced.
Pareto Chart	This bar chart is used to identify and rank problems. It focuses attention on the idea of the critical few versus the trivial many.
Histogram	It is a bar chart of various measures of a process. It is used to measure the distribution of data from a process.
Control Chart	It is the statistically sophisticated tool in order to monitor and control the variation of a process.
Scatter Diagram	It represents the correlation between two variables and may be used to help identify the cause of a problem.
Checksheet	It is a statistical tool that facilitates the accurate collection of data. It is pre-designed forms on which data are recorded by using a checkmark or symbol.
Brainstorming	This technique generates a large number of ideas from a group of people in a relatively short period of time.
Gantt Chart	It is a visual model of what resources are to be used for a particular period of time.

Source: Adapted and modified from Finch, B.J. and Luebbe, R.L., *Operations Management* (Orlando, FL: Harcourt Brace & Company,1995).

Rewards. Rewards were measured using 6 items from Assessment of Organization Climate subscale developed by Hunt (1992). "My Work Unit" was changed to "My Group" to clarify the meanings of items. The following 6 items were included in the dimension: "People in my team are rewarded for good work," "People in my group are paid fairly for the work that they do," "Attempts are made to promote the people in my work unit who do good work," "Leader in my team gives credit to people who do good work," "There are penalties for people in my group," and "There is quick recognition for people in my group for outstanding performance." The scales used a 5 point Likert-type response format with the following response categories to measure the frequency of the behavior: Never, Seldom, Sometimes, Usually, and Always.

Communication. Communication was measured using three items from Assessment of Organization Climate subscale developed by Hunt (1992) and one item from Communication subscale developed by Zeitz et al. (1997). Only one item was chosen from Zeitz et al. (1997) because four items of the six items in their scale were non-communication items. The following 5 items were included in the dimension: "Leader does a good job of communicating with members" "There are effective communication channels between group," "I have opportunity to communicate with my leader," and "We get the information we need to do a good job," and "We have to rely on rumors for information." The scales used a 5 point Likert-type response format with the

following response categories to measure the frequency of the behavior: Never, Seldom, Sometimes, Usually, and Always.

Role of Leader. The role of leader was measured using six items slightly modified from Role of Divisional Top Management and Quality Policy subscale developed by Saraph et al. (1989). Two items were also selected from Assessment of Organization Climate subscale developed by Hunt (1992). Considering participants' low education level, clear statements were selected for the study. The following 8 items were included in the dimension: "Group leader assumes responsibility for quality performance," "Leader is evaluated for quality performance," "Leader supports long-term quality improvement," "Leader participates in the quality improvement process," "Leader has objectives for quality performance," "We understand quality qoals within the group," "People in my group believe that quality and productivity is their responsibility," and "People in my group share responsibility for the success or failure of our products." The scales used a 5 point Likert-type response format with the following response categories to measure the frequency of the behavior: Never, Seldom, Sometimes, Usually, and Always.

Dependent Variables

Three work outcomes were measured. In addition to these work outcomes, performance of QCCs was provided by the organization. The measures are discussed below and reliabilities are noted in Table 10.

Table 10

Reliability of Dependent Variables

Outcome Variables	Previous Research	Reliability coefficent α in previous research	Reliability coefficent α in the pretest
Satisfaction with Work	Villa (2000)	.85	.75
Satisfaction with Leader	Villa (2000)	.96	.64
Commitment	Meyer, Allen, & Smith (1993)	.82	.84

Satisfaction with Work. Satisfaction with work was measured using five items, adapted form the Variety, Accomplishment, and Independence subscales of the *Minnesota Satisfaction Questionnaire* (Weiss, Dawis, England & Lofquist, 1967), and two additional items written to reflect autonomy (Hall,1985; Snizek, 1972). The following 5 items were included in the dimension: "The ability to conduct my job the way I think it should be done," "The variety in my work," "The freedom to use my own judgement," "The feeling of accomplishment I get from the job," and "The opportunity to make a difference in the lives of others." The instrument used response categories scored from 1 to 5, with 1 being "Very satisfied," 2 being "Satisfied," 3 being "Neutral," 4 being "Dissatisfied," and 5 being "Very dissatisfied."

Satisfaction with Leader. Satisfaction with leader was measured using ten items chosen to reflect attitudes of Mexican workers. Four items

were adapted from the Supervision-Human Relations subscale of the *Minnesota Satisfaction Questionnaire*, along with four items from the Supervision-Technical subscale. The following 6 items were included in the dimension: "The way my leader and I understand each other," "The technical know-how of my leader," "The way leader treats group members," "The way my leader backs up the members," "The way my leader handles complaints form members," and "The way my leader resolves scheduling conflicts and interpersonal conflicts." The instrument used response categories scored from 1 to 5, with 1 being "Very satisfied," 2 being "Satisfied," 3 being "Neutral," 4 being "Dissatisfied," and 5 being "Very dissatisfied."

Organizational Commitment. Organizational commitment items were adapted from Meyer, Allen, and Smith's (1993) affective organizational commitment subscale, replacing "my organization" with the name of the company. The affective organizational commitment describes emotional attachment to the organization. One item of affective organizational commitment, "I do not feel like part of the family at my organization," was not included in the study due to mistake. The following 5 items were included in the diemnsion: "(Company) has a great deal of personal meaning for me," "I feel emotionally attached to (company)," "I feel a strong sense of belonging to (company)," "I really feel as if (company's) problems are my own," and "I would be very happy to spend the rest of my career with (company)." The

instrument used anchors scored from 1 to 5, with 1 being "Agree" and 5 being "Disagree."

Performance of Quality Control Circles (QCCs). Performance of QCCs was measured by the company's internal report titled as "Summary of Quality Circle Activities." In this report, an assigned person (usually a plant manager) in each plant evaluates progress of his or her QCCs activities based on 13 steps; (1) selecting a QCC name, (2) deciding the members of the group, (3) selection of theme for improvement, (4) motivation of selection of theme, (5) investigation of the actual situation, (6) establishment of objectives, (7) plan of activities, (8) identification of cause, (9) implementation of measure, (10) confirmation of measure, (11) standardization of the process, (12) field analysis, and (13) documentation for presentation. The organization's performance measurement for quality control circles is often described as the procedure for the pilot project for quality control circles (Barra, 1983). Table 11 describes 13 steps.

Translation

All items were first developed in English (see Appendix B) and items were translated in Spanish. The translation was back-translated to minimize potential translation bias (Brislin, 1980; Werner & Campbell, 1970). A bilingual person who was familiar with Mexican culture and business translated the English scales into Spanish. This version was confirmed by a second generation Mexican who teaches business in a U.S. college.

Table 11

Performance of Quality Control Circles

13 Steps	Descriptions
1. Selection of a QCC name	The circle is known by this name. Having named itself, the circle is ready to begin its activity.
2. The members of a QCC	Members should join the circle voluntarily. It usually has between four and ten people from the same work area.
3. Selection of a QCC theme	Members should select theme that reflects their Skills, abilities, and knowledge.
4. Motivation of selection of theme	The theme should be difficult but solvable. Easy theme and unsolvable theme don't motivate members.
5. Investigation of the actual situation	The circle uses divergent thinking to generate all the facts about the problem area.
6. Establishment of objectives	Definition of the specific objective or problem.
7. Plan of activities	The circle should have clear scheduling and plan in order to solve the problem.
8. Identification of cause	The circle members should ask why many times to get to the source of the problem.
9. Implementation of measure	Data should be measured by appropriate techniques.
10. Confirmation of measure	Data collected at the previous stage should be confirmed in order to standardize the process.
11. Standardization of the process	If the process is beneficial to other work areas, it should be standardized to enhance efficiency.
12. Field analysis	The circle should analyze the probable impact of the solution.
13. Documentation for presentation	Documentation should state what was solved, why is it important, how was it approached, and what is the payoff.

However, the Spanish questionnaire was revised by the TQM manager after the pretest so that plant workers could understand phrases. In other words, an ethnographic approach (Casagrande, 1954), or the method translation yielding the cultural context of the material, was also taken. In the process, the TQM manager was very sensitive to connotations that underlie the original work. He revised items to insure the vocabulary was familiar to participants. The process of the translation was very important because people from different educational backgrounds were expected to respond to a question accurately. The Spanish questionnaire can be found in Appendix C.

Data Analysis

Tests of the four hypotheses will support or reject the theoretical framework illustrated in Figure 1. The fundamental purpose of this study is to test if the dependent variable is predicted by a set of independent variables. In order to achieve this objective, the multiple regression was used. This multivariate technique allows us to test if the linear combination of independent variables was the good predictor of the dependent measure (Hair, Anderson, Tatham, & Black, 1998).

Hypothesis 1

The first hypothesis addresses the relationship between satisfaction with work and four TQM variables. Prior to testing the Hypothesis 1, Pearson correlations were conducted for a membership of the quality control circle, the education level, plant (plants qualified or preparing for ISO 9000, plants not

preparing for ISO 9000), organizational tenure, sex, and satisfaction with work.

Demographic variables that were significantly correlated with satisfaction with work would be entered as independent variables in the multiple regression model together with four hypothesized variables, problem solving environment, TQM tools, rewards, and communication. If hypothesized variables were significantly related with satisfaction with work, then items of the significant variable(s) were investigated using correlation analysis. If demographic variables were significantly related to satisfaction with work, the effect of different level of demographic variables would be tested using t-tests.

Hypothesis 2

The next hypothesis investigates the relationship between satisfaction with leader and three TQM variables. Prior to testing the Hypothesis 2, the Pearson correlations were conducted for a membership of the quality control circle, the education level, plant, organizational tenure, sex, and satisfaction with leader.

Demographic variables that were significantly correlated with satisfaction with leader were entered as independent variables in the multiple regression model together with three hypothesized variables, rewards, communication, and role of leader. If hypothesized variables were significantly related with satisfaction with work, then items of the significant

variable(s) were investigated using correlation analysis. If demographic variables were significantly related with satisfaction with leader, the effect of different level of demographic variables would be tested using t-tests.

Hypothesis 3

The next hypothesis investigates the relationship between organizational commitment and satisfaction with work and leader. Prior to testing the Hypothesis 3, Pearson correlations were conducted for a membership of the quality control circle, the education level, plant, organizational tenure, sex, and organizational commitment.

Demographic variables that were significantly correlated with organizational commitment were entered as independent variables in the multiple regression model together with hypothesized variables, satisfaction with work and leader. If hypothesized variables were significantly related to organizational commitment, then items of the significant variable(s) would be investigated using correlation analysis. If demographic variables were significantly related with organizational commitment, the effect of different level of demographic variables would be tested using t-tests.

Hypothesis 4

The last hypothesis examines the relationship between performance of QCCs and independent variables. Data was selected for QCCs members. Prior to testing the Hypothesis 4, Pearson correlations were conducted for the education level, plant, organizational fenure, sex, and performance.

Demographic variables that were significantly correlated with performance were entered as independent variables in the multiple regression model together with hypothesized variables, problem solving environment, TQM tools, rewards, communication, role of leader, and organizational commitment. If hypothesized variables were significantly related with performance, then items of the significant variable(s) would be investigated using correlation analysis. If demographic variables were significantly related to organizational commitment, the effect of different level of demographic variables would be tested using t-tests.

Chapter 4

RESULTS

The model introduced in the previous chapter (Figure 1) is presented again in Figure 3. The model was tested and the results are presented in the order of hypotheses. The first hypothesis focuses on the relationship between satisfaction with work and problem solving environment, TQM tools, rewards, and communication. The second hypothesis addresses the relationship between satisfaction with work and rewards, communication, and role of leader. The third hypothesis examines the relationship between organizational commitment and satisfaction with work and leader. The fourth hypothesis focuses on the relationship between performance of quality control circles and problem solving environment, TQM tools, rewards, communication, role of leader, and organizational commitment.

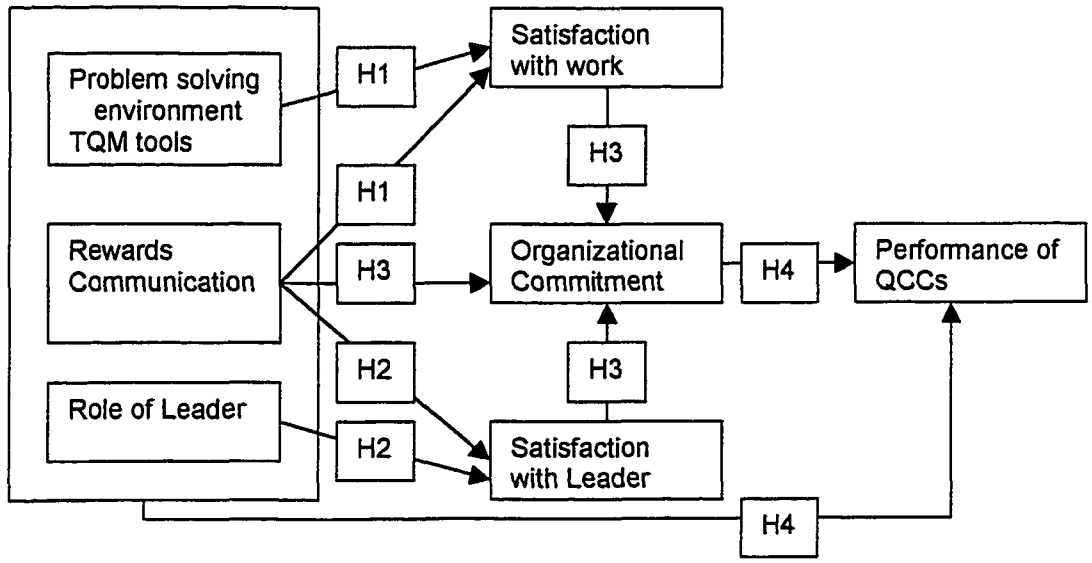


Figure 3. Hypothesized Relations

Factor Analysis

Independent Variables

The 23 items used to measure TQM variables were factor analyzed with a maximum likelihood analysis and a varimax rotation. Based on the results of the pretest, four factors were specified for the extraction. Step 7 in Figure 2 in the previous chapter describes the step of appropriate assignment of items to a factor in order to refine the measures. Two criteria were used to refine the measures of the critical factors of quality management: (1) drop items that cross load on more than one factor, (2) drop items with coefficients below .4.

Based on the two criteria described above, five items were dropped from the measures. Of these five dropped items, the two items cross-loaded on more than one factor. "Leader does a good job of communicating with members" loaded on problem solving environment and communication factors. "Leader in my team gives credit to people who do good work" loaded on problem solving environment, communication, rewards, and role of leader factors. The coefficients of the three items were below .4: "We have to rely on rumors for information" (Communication factor, .246), "There are penalties for people in my group" (Rewards factor, .256), "People in my team stay to the old, established ways of doing the work" (Problem solving environment factor, .168).

Using SPSS reliability program (Hull & Nie, 1981), a reliability coefficient alpha was estimated for four factors. The reliability coefficient

alpha as a set of measurement items refers to the degree to which items in the set are homogeneous and can be estimated using Cronbach's alpha (Nunnally, 1967). Cronbach's alpha was computed for a scale based on a given set of items. Table 12 reports the original sets of measurement items associated with the five independent variables, the items dropped from the original sets that did not meet the criteria, final items for each factor, and the reliability coefficients associated with the resulting scales.

Table 12

Reliability Coefficient Alpha of Independent Variables

Independent Variables	Original Item Numbers	Items Deleted (by number)	Final Items (by number)	Alpha
Problem solving environment	1-4	22	1,2,3,28	.835
Communication	15-19	9,13	16,17,18,31, 32,33	.742
Rewards	20-25	44,45	20,21,22,25	.647
Role of leader	26-33	None	26,27,29,30	.731
TQM tools[a]	5-14	None	5-14	.882

[a]TQM tools were not factor analyzed because they were *a priori* items.

Table 13 shows the results of the factor analysis. Factor 1: Communication reflected quality and amount of communication within and between groups. This factor accounted for 29.28% of the variance. Factor 2: Problem solving environment reflected the work environment that encourages creativity and innovation on the job. This factor accounted for 6.17% of the variance. Factor 3: Role of leader reflected leader's responsibility and involvement in quality management. This factor accounted for 4.81% of the

Table 13

Results of Factor Analysis[a]: Independent Variables

	F1	F2	F3	F4	Alpha
Communication					.742
I have opportunity to communicate with my leader.	.580				
There are effective communication channels between groups.	.549				
People in my group believe that quality and productivity is their responsibility.	.548				
People in my group share responsibility for the success or failure of our products.	.530				
We understand quality goals within the group.	.527				
We get the information we need to do a good job.	.518				
Problem Solving Environment					.835
People in my team are encouraged to try new and better ways of doing the job.		.808			
Members are encouraged to make suggestions for improvements in our work.		.693			
Creativity is actively encouraged in this group.		.471			
Leader supports long-term quality improvement.		.458			
Role of Leader					.731
Leader is evaluated for quality performance.			.611		
Group leader assumes responsibility for quality performance.			.609		
Leader participates in the quality improvement process.			.502		
Leader has objectives for quality performance.			.475		
Rewards					.647
There is quick recognition for people in my group for outstanding performance.				.605	
People in my group are paid fairly for the work that they do.				.508	
Attempts are made to promote the people in my job work unit who do good work.				.508	
People in my team are rewarded for good work.				.480	

[a]Extraction Method: Maximum Likelihood.
Rotation Method: Varimax with Kaiser Normalization.

variance. Factor 4: Rewards reflected either intrinsic or extrinsic rewards that were perceived by participants. This factor accounted for 4.37% of the variance. A total of 44.64% of the variability was accounted for by all four factors.

Step 8 in the previous chapter describes measurement validity. The 5 measures of the critical factors of quality management developed in this study have content validity because selection of measurement items was based on both a review of the literature and evaluations by academicians and practitioners. The 5 measures of the critical factors of quality management also have construct validity because most of the items identified by the factor analysis were assigned to appropriate factors. Although 3 role of leader items, "We understand quality goals with the group," "People in my group believe that quality and productivity is their responsibility," and "People in my grouop share responsibility for the success or failure of our products" loaded on communication factor, it can be argued that goals and responsibility are shared through communication.

Dependent Variables

The 16 items used to measure work outcome variables were factor analyzed with a maximum likelihood analysis and varimax rotation. Based on the results of the pretest, three factors were specified for the extraction. Step 7 in Figure 2 in the previous chapter describes the step of appropriate assignment of items to a factor in order to refine the measures. Two criteria

were used to refine the measures of the critical factors of quality management: (1) drop items that cross load with more than one factor, (2) drop items with coefficients below .4.

Based on the two criteria described above, "The opportunity to make a difference in the lives of others" was dropped from the measures because the coefficient was only .169.

Using SPSS reliability program (Hull & Nie, 1981), a reliability coefficient alpha was estimated for three factors. Cronbach's alpha was computed for a scale based on a given set of items. Table 14 reports the original sets of measurement items associated with the five independent variables, the items dropped from the original sets that did not meet the criteria, final items for each factor, and the reliability coefficients associated with the resulting scales.

Table 14

Reliability Coefficient Alpha of Dependent Variables

Dependent Variables	Original Item Numbers	Items Deleted (by number)	Final Items (by number)	Alpha
Satisfaction with leader	34-39	None	34-39	.877
Satisfaction with work	40-44	44	40,41,42,43	.681
Organizational commitment	45-50	None	45-50	.901

Table 15 shows the results of the factor analysis. Factor 1: Organizational commitment reflected participants' emotional involvement or attachment of participants. This factor accounted for 30.63% of the variance.

Factor 2: Satisfaction with leader reflected participants' perceived job-related satisfaction with leader. This factor accounted for 17.20% of the variance. Factor 3: Satisfaction with work reflected participants' perceived satisfaction with work itself. This factor accounted for 7.09% of the variance. A total of 54.93% of the variability was accounted for by all four factors.

Hypothesis Testing

Means, standard deviations, and Pearson correlations among independent and dependent variables are given in Table 16. The correlation analysis shows that satisfaction with work was significantly correlated with problem solving environment ($r = .221$, $p < .01$), TQM tools ($r = .169$, $p < .05$), rewards ($r = .223$, $p < .01$), communication ($r = .295$, $p < .01$), and role of leader ($r = .210$, $p < .01$). Satisfaction with leader was significantly correlated with problem solving environment ($r = .352$, $p < .01$), TQM tools ($r = .201$, $p < .05$), rewards ($r =. 355$, $p < .01$), and communication ($r = .407$, $p < .01$), role of leader ($r = .402$, $p < .01$), and satisfaction with work ($r = .558$, $p < .01$). Organizational commitment was negatively, but significantly correlated with problem solving environment ($r = -.159$, $p < .05$), TQM tools ($r = -.196$, $p < .05$), rewards ($r = -.330$, $p < .01$), satisfaction with leader ($r = -.325$, $p < .01$), satisfaction with work ($r = -.218$, $p < .01$), and satisfaction with leader ($r = -.201$, $p < .01$). Performance of quality control circles was not significantly correlated with any independent or dependent variables in the study.

Table 15

Results of Factor Analysis[a]: Dependent Variables

	F1	F2	F3	Alpha
Organizational Commitment				.901
(Company) has a great deal of personal meaning for me.	.911			
I feel emotionally attached to (company).	.881			
I feel a strong sense of belonging to (company).	.788			
I really feel as if (company's) problems are my own.	.783			
I wold be very happy to spend the rest of my career with (company).	.602			
Satisfaction with Leader				.877
The way my leader resolves scheduling conflicts and interpersonal conflicts.		.944		
The way my leader handles complaints from members.		.678		
The way leader treats group members.		.663		
The way my leader backs up the members.		.647		
The technical know-how of my leader.		.639		
The way my leader and I understand each other.		.488		
Satisfaction with Work				.681
The freedom to use my own judgement.			.504	
The variety in my work.			.461	
The feeling of accomplishment I get from the job.			.455	
The ability to conduct my job the way I think it should be done.			.404	

[a]Extraction Method: Maximum Likelihood.
Rotation Method: Varimax with Kaiser Normalization.

Table 16

Descriptive Statistics of Hypothesized Variables

Variables	Mean	SD	1	2	3	4
1. PSE	3.750	.970	1.000			
2. TOOL	3.972	.961	.533**	1.000		
3. REW	3.067	.906	.478**	.403**	1.000	
4.COMM	3.994	.697	.513**	.400**	.279**	1.000
5. LEAD	4.189	.717	.579**	.444**	.400**	.491**
6. SATWRK	3.868	.610	.221**	.169*	.223**	.295**
7. SATLED	3.737	.674	.352**	.201*	.355**	.407**
8.CMT	2.257	1.102	-.159*	-.196*	-.330**	-.155
9.PERF[a]	4.322	3.010	.039	.016	-.054	-.034

[a]The sample was selected only for QCC members. The mean shows the progress of QCCs activities based on the 13 steps.

*$p < .05$

**$p < .01$

Variables

PSE: Problem Solving Environment

TOOL: TQM Tools

REW: Rewards

COMM: Communication

LEAD: Role of Leader

SATWRK: Satisfaction with work.

SATLED: Satisfaction with Leader

CMT: Organizational Commitment

PERF: Performance of QCCs

Table 16 continued

Variables	5	6	7	8	9
1. PSE					
2. TOOL					
3. REW					
4.COMM					
5. LEAD	1.000				
6. SATWRK	.210**	1.000			
7. SATLED	.402**	.558**	1.000		
8.CMT	-.325**	-.218**	-.201**	1.000	
9.PERF[a]	-.159	.065	.138	.012	1.000

[a]The sample was selected only for QCC members.
*$p < .05$
**$p < .01$

Variables
PSE: Problem Solving Environment
TOOL: TQM Tools
REW: Rewards
COMM: Communication
LEAD: Role of Leader
SATWRK: Satisfaction with work.
SATLED: Satisfaction with Leader
CMT: Organizational Commitment
PERF: Performance of QCCs

Hypothesis 1

The first hypothesis focuses on the relationship between satisfaction with work and problem solving environment, TQM tools, rewards, and communication. Pearson correlations were conducted for membership in the quality control circles (QCCs), the education level, plant (plants qualified or preparing for ISO 9000, plants not preparing for ISO 9000), organizational tenure, sex, and satisfaction with work to examine impacts of demographic variables on the hypothesis. Table 17 reports results of the correlation analysis. No demographic variables were significantly correlated with satisfaction with work.

It was predicted that job satisfaction is positively related with the 4 independent variables: (H1a) perceived level of problem-solving environment, (H1b) the perceived level of extent use of TQM tools, (H1c) the perceived level of rewards, and (H1d) the perceived amount of communication. Table 18 presents the results of the multiple regression analysis for Hypothesis 1.

The linear relationship between satisfaction with work and independent variables was statistically significant ($F_{4, 150} = 4.591$; $p < .01$). The independent variables explained only 8.5% of variance of satisfaction with work. For 4 hypothesized relationships, only H1d: the relationship between satisfaction with work and communication was supported (t-value = 2.633; $p < .01$). These results did not support H1a, H1b, and H1c.

Table 17

Results of Intercorrelations: Demographic Variables and Satisfaction with Work

	1	2	3	4	5	6
1.QCCs	1.000					
2.EDU	-.020	1.000				
3.PLANT	.585**	-.052	1.000			
4.TENURE	-.001	-.096	.073	1.000		
5.SEX	.037	-.345**	.069	.182*	1.000	
6.SATWRK	.095	-.069	-.009	-.063	.016	1.000

* $p < .05$
** $p < .01$

Variables

QCCs: Quality Control Circles (1:Member; 2:Non-member)

EDU: Education Level (1: Low education; 2:High education)

PLANT: Plant (1:Plants qualified or preparing for ISO 9000; 2:Plants not preparing for ISO 9000).

TENURE: Organization Tenure (1: less than 3 years; 2: 3 years or longer).

SEX: Sex (1: Male; 2:Female)

SATWRK: Satisfaction with work.

Table 18

Results of Multiple Regression: Relationships between Satisfaction with Work and Independent Variables[a]

	Standardized β	t-value
Problem Solving Environment	.031	.294
TQM Tools	.000	.000
Rewards	.141	1.578
Communication	.240	2.633**
Adjusted R^2	.085	
F	4.591**	
Df	4, 150	

[a] $N = 155$
** $p < .01$

Communication items were further examined using correlation analysis. The results reveal that satisfaction with work was significantly correlated with "I have opportunity to communicate with leader" ($r = .299$; $p < .01$), "People believe that quality and productivity is their responsibility" ($r = .311$; $p < .01$), "People share responsibility for the success or failure of products" ($r = .162$; $p < .05$), and "We understand quality goals within the group" ($r = .239$; $p < .01$). Table 19 displays the results of the correlation between work satisfaction and the communication items.

Table 19

Results of Intercorrelations: Satisfaction with Work and Communication Items

	1	2	3	4	5	6	7
1.SATWRK	1.000						
2. OPP	.299**	1.000					
3.CHAN	.134	.319**	1.000				
4.BELIEF	.311**	.331**	.395**	1.000			
5.RESP	.162*	.324**	.322**	.488**	1.000		
6.UND	.239**	.354**	.295**	.367**	.361**	1.000	
7.INF	.122	.388**	.338**	.225**	.267**	.158	1.000

* $p < .05$
** $p < .01$

Variable
SATWRK: Satisfaction with Work
Communication Items
OPP: I have opportunity to communicate with leader.
CHAN: There are effective communication channels between groups.
BELIEF: People believe that quality and productivity is their responsibility.
RESP: People share responsibility for the success or failure of products.
UND: We understand quality goals within the group.
INF: We get the information we need to do a good job.

Hypothesis 2

The second hypothesis focuses on the relationship between satisfaction with leader and rewards, communication, and role of leader. The Pearson correlations were computed for membership in quality control circles (QCCs), the education level, plant (plants qualified or preparing for ISO 9000, plants not preparing for ISO 9000), organizational tenure, sex, and satisfaction with leader to examine impacts of demographic variables. There was no significant relationship between satisfaction with leader and demographic variables. Table 20 reports results of the correlation analysis.

Table 20

Results of Intercorrelations: Demographic Variables and Satisfaction with Leader

	1	2	3	4	5	6
1.QCCs	1.000					
2.EDU	-.020	1.000				
3.PLANT	.585**	-.052	1.000			
4.TENURE	-.001	-.096	.073	1.000		
5.SEX	.037	-.345**	.069	.182*	1.000	
6.SATLED	-.017	-.141	-.050	-.019	.062.	1.000

* $p < .05$
** $p < .01$

Variables
QCCs: Quality Control Circles (1:Member; 2:Non-member)

EDU: Education Level (1: Low education; 2:High education)

PLANT: Plant (1:Plants qualified or preparing for ISO 9000; 2:Plants not preparing for ISO 9000).

TENURE: Organization Tenure (1: less than 3 years; 2: 3 years or longer).

SEX: Sex (1: Male; 2:Female)

SATLED: Satisfaction with Leader

It was predicted that satisfaction with leader is positively related to the three independent variables: (H2a) the perceived level of rewards, (H2b) the perceived amount of communication, and (H2c) the perceived level of leader's involvement in quality management. Table 21 presents the results of the multiple regression analysis for Hypothesis 2.

The relationship between satisfaction with leader and independent variables was statistically significant ($F_{3, 151} = 17.187$; $p < .01$). The independent variables explained 24% of variance of satisfaction with leader. All three hypothesized relationships were statistically significant: (H2a) the relationship between satisfaction with leader and rewards was supported (*t*-value=2.679; p< .01), (H2b) the relationship between satisfaction with leader and communication was supported (*t*-value = 3.126; $p <$. 01), and (H2c) the relationship between satisfaction with leader and leader's involvement in quality management (*t*-value = 2.293; $p < .01$).

Items for all independent variables were further examined using correlation analyses. For rewards, the results reveal that satisfaction with leader was significantly correlated with "There is quick recognition for people in my group for outstanding performance" (r = .288; $p < .01$), "People in my group are paid fairly for the work that they do" (r = .219; $p < .01$), "Attempts are made to promote the people in my job work unit who do good work" (r = .240; $p < .01$), and "People in my team are rewarded for good work" (r = .249; $p < .01$).

Table 21

Results of Multiple Regression: Relationships between Satisfaction with Leader and Independent Variables[a]

	Standardized β	*t*-value
Rewards	.206	2.679**
Communication	.253	3.126**
Role of Leader	.195	2.293*
Adjusted R^2	.240	
F	17.187**	
Df	3,151	

[a] N =155
* $p < .05$
** $p < .01$

Table 22 reports results of the correlation analysis between satisfaction with leader and rewards items. For communication, the results reveal that satisfaction with leader was significantly correlated with "I have opportunity to communicate with leader" (r = .329; $p < .01$), "There are effective communication channels between groups" (r = .295; $p < .01$), "People believe that quality and productivity is their responsibility" (r = .331; $p < .01$), "People share responsibility for the success or failure of products" (r = .170; $p < .05$), "We understand quality goals within the group" (r = .280; $p < .01$), and "We get the information we need to do a good job" (r = .219; $p < .01$). Table 23 displays the results of the correlation between work satisfaction and the communication items.

Table 22

Results of Intercorrelations: Satisfaction and Leader Rewards Items

	1	2	3	4	5
1.SATLED	1.000				
2.RECOG	.288**	1.000			
3.PAY	.219**	.285**	1.000		
4.PRMT	.240**	.318**	.341**	1.000	
5.REW	.249**	.356**	.303**	.316**	1.000

* $p < .05$
** $p < .01$

Variable
SATLED: Satisfaction with Leader
Rewards Items
RECOG: There is quick recognition for people in my group for outstanding performance.
PAY: People in my group are paid fairly for the work that they do.
PRMT: Attempts are made to promote the people in my job work unit who do good work.
REW: People in my team are rewarded for good work.

Table 23

Results of Intercorrelations: Satisfaction with Leader and Communication Items

	1	2	3	4	5	6	7
1.SATLED	1.000						
2. OPP	.329**	1.000					
3.CHAN	.295**	.319**	1.000				
4.BELIEF	.331**	.331**	.395**	1.000			
5.RESP	.170*	.324**	.322**	.488**	1.000		
6.UND	.280**	.354**	.295**	.367**	.361**	1.000	
7.INF	.219**	.388**	.338**	.225**	.267**	.158	1.000

* $p < .05$
** $p < .01$

Variables
SATLED: Satisfaction with Leader
OPP: I have opportunity to communicate with leader.
CHAN: There are effective communication channels between groups.
BELIEF: People believe that quality and productivity is their responsibility.
RESP: People share responsibility for the success or failure of products.
UND: We understand quality goals within the group.
INF: We get the information we need to do a good job.

For role of leader, the results revealed that satisfaction with leader was significantly correlated with "Leader is evaluated for quality performance" ($r = .294$; $p < .01$), "Leader assumes responsibility for quality performance" ($r = .423$; $p < .01$), "Leader participates in the quality improvement" ($r = .207$; $p < .01$), and "Leader has objectives for quality performance" ($r = .282$; $p < .01$), Table 24 displays the results of the correlation between work satisfaction and the role of leader items.

Table 24

Results of Intercorrelations: Satisfaction with Leader and Role of Leader Items

	1	2	3	4	5
1.SATLED	1.000				
2.LEV	.294**	1.000			
3. RESP	.423**	.501**	1.000		
4.PAR	.207**	.353**	.309**	1.000	
5.OBJ	.282**	.415**	.334**	.520**	1.000

* $p < .05$
** $p < .01$

Variable
SATLED: Satisfaction with Leader

Role of Leader Items
LEV: Leader is evaluated for quality performance.
RESP: Leader assumes responsibility for quality performance.
PAR: Leader participates in the quality improvement.
OBJ: Leader has objectives for quality performance.

Hypothesis 3

The third hypothesis examines the relationship between organizational commitment and satisfaction with work and leader. Pearson correlations were computed for membership in quality control circles (QCCs), the education level, plant (plants qualified or preparing for ISO 9000, plants not preparing for ISO 9000), organizational tenure, sex, and organizational commitment to examine impacts of demographic variables. The education level was negatively, but significantly correlated with organizational commitment (r = .204; $p < .05$). Table 25 displays results of the correlation analysis.

Table 25

Results of Intercorrelations: Demographic Variables and Organizational Commitment

	1	2	3	4	5	6
1.QCCs	1.000					
2.EDU	-.020	1.000				
3.PLANT	.585**	-.052	1.000			
4.TENURE	-.001	-.096	.073	1.000		
5.SEX	.037	-.345**	.069	.182*	1.000	
6.ORGCMT	.101	-.204*	-.045	-.056	.095	1.000

* $p < .05$
** $p < .01$

Variables
QCCs: Quality Control Circles (1:yes; 2:no)

EDU: Education Level (1: Low education; 2:High education)

PLANT: Plant (1:Plants qualified or preparing for ISO 9000; 2:Plants not preparing for ISO 9000).

TENURE: Organization Tenure (1: less than 3 years; 2: 3 years or longer).

SEX: Sex (1: Male; 2:Female)
ORGCMT: Organizational Commitment

It was predicted that organizational commitment is positively related to the 4 independent variables: (H3a) the perceived level of rewards,

(H3b) the perceived amount of communication, (H3c) the perceived level of satisfaction with work, and (H3d) the perceived level of satisfaction with leader. Table 26 displays the results of the multiple regression analysis for Hypothesis 3.

The relationship between organizational commitment and independent variables was statistically significant ($F_{5, 151} = 5.635$; $p < .01$). The independent variables explained 13.2% of variance of organizational commitment. It was found that 2 hypothesized relationships were statistically significant: (H3a) the relationship between organizational commitment and rewards (t-value = -3.418; $p < .01$), and (H3c) the relationship between organizational commitment and satisfaction with work (t-value = -1.720; $p < .10$). However, these significant relationships were negative. These results did not support Hypothesis 3. The education level was found to be positively related to organizational commitment (t-value = 1.852; $p < .10$).

Items for rewards and satisfaction with work were further examined using correlation analyses. For rewards, "People are paid fairly for the work they do" ($r = -.319$; $p < .01$) and "Attempts are made to promote the people who do good work" ($r = -.324$; $p < .01$) were negatively and significantly related to organizational commitment. Table 27 reports results of the correlation analysis between organizational commitment and satisfaction with work.

Table 26

Results of Multiple Regression: Relationships between Organizational Commitment with Leader and Independent Variables[a]

	Standardized β	t-value
Education	.143	1.852*
Rewards	.283	-3.418***
Communication	.011	-.137
Satisfaction with Work	.158	-1.720*
Satisfaction with Leader	-.014	.137
Adjusted R^2	.132	
F	5.635***	
Df	5, 142	

[a] N =148
* $p < .10$
*** $p < .01$

Table 27

Results of Intercorrelations: Organizational Commitment and Rewards

	1	2	3	4	5
1.CMT	1.000				
2.RECOG	-.161	1.000			
3.PAY	-.319**	.285**	1.000		
4.PRMT	-.324**	.318**	.341**	1.000	
5.REW	-.141	.356**	.303**	.316**	1.000

*$p < .05$
**$p < .01$

Variable
CMT: Organizational commitment

Rewards Items
RECOG: There is quick recognition for people for outstanding performance.
PAY: People are paid fairly for the work that they do.
PRMT: Attempts are made to promote the people who do good work.
REW: People are rewarded for good work.

For satisfaction with work, "The freedom to use own judgement" (r = -.250; $p < .01$) and "The variety in work" (r = -.238; $p < .01$) were negatively and significantly related to organizational commitment.

Table 28 reports results of the correlation analysis between organizational commitment and satisfaction with work.

Table 28

Results of Intercorrelations: Organizational Commitment and Satisfaction with Work Items

	1	2	3	4	5
1.CMT	1.000				
2.FREE	-.250**	1.000			
3.VARIET	-.238**	.445**	1.000		
4.ACCOM	-.042	.226**	.284**	1.000	
5.ABILITY	-.097	.452**	.423**	.283**	1.000

*$p < .05$
**$p < .01$

Variable
CMT: Organizational commitment

Satisfaction with Work Items
FREE: The freedom to use own judgement.
VARIET: The variety in work.
ACCOM: The feeling of accomplishment I get from the job.
ABILITY: The ability to conduct job the way I think it should be done.

The regression analysis showed that the education level is positively related with organizational commitment. To address the main effect of the education level, independent t-tests were conducted in order to compare statistical differences between high education and low education groups. Table 29 shows the results of t-tests.

Table 29

Results of Independent T-Tests: Main Effect of Education on Organizational Commitment

Items	High[a] Education		Low[b] Education		t-value (df)
	Mean	SD	Mean	SD	
(Company)[c] has a great deal of personal meaning for me.	2.605	1.386	2.026	1.111	2.61** (151)
I feel emotionally attached to (Company).	2.684	1.317	2.097	1.164	2.59** (149)
I feel a strong sense of belonging to (Company).	2.432	1.236	2.106	1.120	1.49 (148)
I really feel as if (Company's) problems are my own.	2.578	1.328	2.087	1.128	2.22** (151)
I would be very happy to spend the rest of my career with (Company).	2.789	1.318	2.339	1.126	1.88* (151)

[a]A junior high school or lower degree.
[b]Some high school experience or higher than high school degree.
[c](Company): The name of the company.
* $p < .10$
** $p < .05$

In general, the results indicated that the two groups perceived organizational commitment differently. Participants with higher education (some high school experience or higher than high school degree) showed significantly higher organizational commitment than those with lower education (a junior high school or lower degree) for: "(Company) has a great deal of personal meaning for me" (t-value = 2.61; $p < .05$), "I feel emotionally attached to (company)" (t-value = 2.59; $p < .05$), "I really feel as if (company's) problems are my own" (t-value = 2.22; $p < .05$), and "I would be very happy to spend the rest of my career with (company)" (t-value = 1.88; $p < .10$).

Hypothesis 4

The fourth hypothesis examines the relationship between performance of quality control circles and problem solving environment, TQM tools, rewards, communication, role of leader, and organizational commitment. The sample was selected for QCCs members only. Pearson correlations were computed for the education level, plant (plants qualified or preparing for ISO 9000, plants not preparing for ISO 9000), organizational tenure, sex, and organizational commitment to examine impacts of demographic variables. Plant was significantly correlated with performance ($r = -.307$; $p < .01$). Table 30 displays results of the correlation analysis.

Table 30

Results of Intercorrelations: Demographic Variables and Performance

	1	2	3	4	5
1.EDU	1.000				
2.PLANT	.119	1.000			
3.TENURE	-.112	.104	1.000		
4.SEX	-.296**	-.108	.205*	1.000	
5.PERF	.013	-.307**	-.129	.048	1.000

*$p < .05$
**$p < .01$

Variables
EDU: Education Level (1: Low education; 2:High education)
PLANT: Plant (1:Plants qualified or preparing for ISO 9000; 2:Plants not preparing for ISO 9000).
TENURE: Organization Tenure (1: less than 3 years; 2: 3 years or longer).
SEX: Sex (1: Male; 2:Female)
PERF: Performance of QCCs: Progress of QCCs activities.

It was predicted that performance is positively related with the 6 independent variables: (H4a) the perceived level of organizational

commitment, (H4b) the perceived level of problem-solving environment, (H4c) the perceived level of extent use of TQM tools, (H4d) the perceived amount of communication, (H4e) the perceived level of rewards, and (H4f) the perceived level of leader's involvement in quality management. Table 31 displays the results of the multiple regression analysis for Hypothesis 4.

The model in Hypothesis 4 was statistically significant ($F_{7,88} = 2.284$; $p < .05$). The independent variables explained only 8.6% of variance of QCCs performance. It was found that 2 hypothesized relationships were statistically significant: (H4b) the relationship between performance and problem solving environment (t-value = 1.705; $p < .10$), and (H4f) the negative relationship between performance and role of leader (t-value = -1.962; $p < .10$). These results supported H4b, but did not support H4a, H4c, H4d, H4e, and H4f. Plant was also found to be related with performance (t-value = -.2.893; $p < .05$).

Items for problem solving environment and role of leader were further examined using correlation analyses. For problem solving environment, there was no significantly correlated with performance. Table 32 reports results of the correlation analysis between performance and problem solving environment. For role of leader, no one item was significantly correlated with performance. Table 33 reports results of the correlation analysis between performance and role of leader.

Table 31

Results of Multiple Regression: Relationships between Performance and Independent Variables[a]

	Standardized β	t-value
Plant	-2.893	-2.893**
Organizational Commitment	-.040	-.367
Problem Solving Environment	.237	1.705*
TQM Tools	-.062	-.615
Rewards	-.071	-.632
Communication	-.035	-.289
Role of Leader	-.266	-1.962*
Adjusted R^2	.086	
F	2.284**	
Df	7, 88	

[a] N =96
* $p < .10$
** $p < .05$

Table 32

Results of Intercorrelations: Performance and Problem Solving Environment Items

	1	2	3	4	5
1.PERF	1.000				
2.NEW	.052	1.000			
3.SUGG	.095	.729**	1.000		
4.CRE	.012	.570**	.536**	1.000	
5.LONG	-.030	.540**	.328**	.333**	1.000

*$p < .05$
**$p < .01$

Variable

PERF: Performance of QCCs: Progress of QCCs activities.

Problem Solving Environment Items

NEW: People in my team are encouraged to try new and better ways of doing the job.

SUGG: Members are encouraged to make suggestions for improvements in work.

CRE: Creativity is actively encouraged.

LONG: Leader supports long-term quality improvement.

Table 33

Results of Intercorrelations: Performance and Role of Leader Items

	1	2	3	4	5
1.PERF	1.000				
2.LEV	-.070	1.000			
3.RES	-.167	.491**	1.000		
4.PAR	-.150	.297**	.417**	1.000	
5.OBJ	-.116	.450**	.369**	.448**	1.000

*$p < .05$
**$p < .01$

Variable
PERF: Performance of QCCs: Progress of QCCs activities.
Role of Leader Items
LEV: Leader is evaluated for quality performance.
RES: Group leader assumes responsibility for quality performance.
PAR: Leader participates in the quality improvement process.
OBJ: Leader has objectives for quality performance.

The regression analysis showed that plant is related with QCCs performance. To address the main effect of the education level, an independent t-test was conducted in order to compare statistical differences between plants that are qualified for ISO 9000 or preparing for ISO 9000 and plants that are not preparing for ISO 9000. Table 34 shows the results of t-tests.

Table 34

Results of Independent T-Tests: Main Effect of Plant on Performance

	ISO 9000-based Plants		Other Plants		
Items	Mean	SD	Mean	SD	t-value (df)
Performance	4.686	3.083	2	0.000	3.127** (94)

** $p < .01$

The mean performance of QCCs for participants who were working for plants that were not preparing for ISO 9000 was 2: "The members of the group were determined." The performance of QCCs for participants who were working in the ISO 9000 based plants (mean = 4.686) was significantly higher than that in the non-ISO 9000 based plants (t-value = 3.127; $p < .01$).

Table 35 summarizes results of hypothesis tests. Of 17 hypothesized relationships between work outcomes and TQM variables, 5 received supports.

Table 35

List of Hypotheses Tested in the Study

	Hypotheses	Results
H1a	The greater the perceived level of problem-solving environment, the greater the perceived job satisfaction.	Not supported
H1b	The greater the perceived level of extent use of TQM tools, the greater the perceived job satisfaction.	Not supported
H1c	The greater the perceived level of rewards, the greater the perceived job satisfaction.	Not supported
H1d	The greater the perceived amount of communication, the greater the perceived job satisfaction.	Supported
H2a	The greater the perceived level of rewards, the greater the perceived satisfaction with their leader.	Supported
H2b	The greater the perceived amount of communication, the greater the perceived satisfaction with their leader.	Supported
H2c	The greater the perceived level of leader's involvement in quality management, the greater the perceived satisfaction with their leader.	Supported
H3a	The greater the perceived level of rewards, the greater the perceived organizational commitment.	Not supported
H3b	The greater the perceived amount of communication, the greater the perceived organizational commitment.	Not supported
H3c	The greater the perceived level of job satisfaction, the greater the perceived organizational commitment.	Not supported
H3d	The greater the perceived level of satisfaction with leader, the greater the perceived organizational commitment.	Not supported
H4a	The greater the perceived level of organizational commitment, the higher the performance of QCCs.	Not supported
H4b	The greater the perceived level of problem-solving environment, the higher the performance of QCCs.	Supported
H4c	The greater the perceived level of extent use of TQM tools, the higher the performance of QCCs.	Not supported
H4d	The greater the perceived amount of communication, the higher the performance of QCCs.	Not supported
H4e	The greater the perceived level of rewards, the higher the performance of QCCs.	Not supported
H4f	The greater the perceived level of leader's involvement in quality management, the higher the performance of QCCs.	Not supported

Chapter 5

DISCUSSION

This was one of the first studies to empirically examine how Mexican workers in a maquiladora perceived the impact of TQM on job satisfaction, leader satisfaction, organizational commitment, and performance of quality control circles. An examination of the hypotheses related to the research questions shows that 5 of 17 hypotheses were supported.

Hypotheses Related to Satisfaction with Work

Four hypotheses tested the relationship between perceived satisfaction with work and (H1a) problem-solving environment, (H1b) TQM tools, (H1c) rewards, and (H1d) communication. Of the 4 hypotheses, 1 was supported: "The greater the perceived amount of communication, the greater the perceived job satisfaction." Of the 6 communication items identified using the factor analysis, 4 were significantly related to satisfaction with work. These four communication items were:

- I have opportunity to communicate with leader.
- People believe that quality and productivity is their responsibility.
- People share responsibility for the success or failure of products.
- We understand quality goals within the group.

Communication-related items seem to be correlates of job satisfaction. This study supports Bacon's (1980) contention that organizational members perceive job satisfaction when they perceived less ambiguity in

communication. It also supports Wheeless et al's (1984) claim that the communication variables are related to various aspects of job satisfaction.

This finding suggests that a leader or supervisor communicate to members of quality control circles or work units the meaning and importance of high quality and the routes to attaining it in an organized, clear, and concise manner. Members or subordinates need to communicate quality problems and suggestions for increasing quality to their leader, and members of groups need to share their ideas for improving quality with each other. The success of leaders and organizations may depend on communication and it is essential in order to coordinate individual activities in quality control circles.

Contrary to the existing literature related to satisfaction with work, this study found that problem-solving environment, TQM tools, and rewards were not related to job satisfaction. In particular, relationships between satisfaction and TQM tools and problem-solving environment were weak. Perhaps, these findings imply that there are gaps between TQM requirements and skills, abilities, and knowledge of workers.

TQM is a problem-solving approach which largely depends on reasoning and numerical abilities of members. Members of TQM organizations are expected to suggest new and better ways to improve the processes and designs using TQM tools. However, 75.2% of workers in the organization had only a junior high school or lower degree, probably limiting their abilities to suggest better ways to improve process and designs.

Although it was not tested, these results imply that leaders can involve workers to generate or understand problem areas, but not to analyze causes or to verify improvement results without providing more training workers. In order to maintain or increase satisfaction with work, the organization may need to encourage workers education and self-development, provide specialized training, and carefully appraise performance to help employees identify strengths and areas needing enhancement.

Hypotheses Related to Satisfaction with Leader

Three hypotheses tested the relationship between perceived satisfaction with leader and (H2a) rewards, (H2b) communication, and (H2c) role of leader. All three hypotheses were supported: "The greater the perceived level of rewards, the greater the perceived satisfaction with their leader," "The greater the perceived amount of communication, the greater the perceived satisfaction with their leader," and "The greater the perceived level of role of leader, the greater the perceived job satisfaction."

Of the 4 rewards items identified using the factor analysis, all 4 were significantly related with satisfaction with leader. These 4 items were:

- There is quick recognition for people in my group for outstanding performance.
- People in my group are paid fairly for the work that they do.
- Attempts are made to promote the people in my job work unit who do good work.

- People in my team are rewarded for good work.

Recognition takes many forms, from verbal or written recognition to pay increases or promotions. As Milkovich and Newman (1993) contend, reward systems seem to enhance mutual understanding between members and leaders. This, in turn, may result in cooperation, joint efforts, the sharing of information, knowledge, and expertise among workers in a group or work unit.

All 6 communication items were significantly related to satisfaction with leader. These 6 communication items were:

- I have opportunity to communicate with leader.
- There are effective communication channels between groups.
- People believe that quality and productivity is their responsibility.
- People share responsibility for the success or failure of products.
- We understand quality goals within the group.
- We get the information we need to do a good job.

This result supports Berman and Hellweb's (1989) claim that there is a strong relationship between satisfaction with leader and perceived leader communication competence. Their study implies positive effects of quality circles on communication.

It was found that communication with a worker's immediate supervisor was especially important for workers to perceive satisfaction with their role in the group and to feel more positive about sharing information. Communication

seems to be a key to the success of TQM program because the more embedded a quality circle is in organizational networks, the greater the likelihood is that its proposals will be accepted and implemented (Stohl, 1986).

Of the 4 role of leader items identified using the factor analysis, all 4 were significantly related to satisfaction with leader. These four role of leader items were:

- Leader is evaluated for quality performance.
- Leader assumes responsibility for quality performance.
- Leader participates in the quality improvement.
- Leader has objectives for quality performance.

Although participation of the leader in quality improvement efforts is important in TQM (Deming, 1986; Saraph et al., 1989), this result may be interpreted as a reflection of the hierarchical nature of Mexican culture. Mexican culture is very hierarchical in almost all respects (Lawrence & Yeh, 1994). Hofstede (1980) found that Mexico to be the second highest of 40 countries surveyed in his power distance dimension that is the extent to which people accept unequal distribution of power in a society. In a high power distance culture such as Mexico, workers expect to receive commands from their supervisors, and conflicts are solved through formal rules and authority. The result also supports Bourgeois and Boltvinick's (1981, p. 77) contention that an authoritarian style is demanded in Latin America: "Any offer made to a

Latin American to participate in decision making would not only be met with bewilderment but would result in lower respect for the superior."

TQM encourages each member of the organization to set his or her own themes or objectives. However, the top management and leaders should be aware the hierarchical nature of Mexican culture in order to avoid members' total resistance to the TQM approach. If the top management of the organization wishes to change the organizational culture, it should be remembered that such a change does not occur over night. As suggested previously, workers need to receive education and specialized training in order to maintain satisfaction with leader while developing their skills, abilities, and knowledge.

Hypotheses Related to Organizational Commitment

Four hypotheses examined the relationship between perceived organizational commitment and (H3a) rewards, (H3b) communication, (H3c) satisfaction with work, and (H3d) satisfaction with leader. Except for rewards, none of these independent variables was significantly and positively related to organizational commitment.

Of the 4 rewards items, 2 were negatively but significantly related with organizational commitment. These 2 rewards items were:

- People in my group are paid fairly for the work that they do.
- Attempts are made to promote the people in my job work unit who do good work.

Contrary to claims made by some researchers (Angle, 1983; Mowday et al., 1982; Steers, 1977), this study did not find the strong and positive relationship between rewards and organizational commitment. These results can be explained by low mean scores of rewards (mean = 3.06) and organizational commitment (mean = 2.25) that were presented in Table 16. Perhaps, workers perceive neither fair distribution nor fair procedures. According to Cropanzano and Folger (1996, p. 80), "once an inequitable outcome is paired with an unfair decision rule, the typically negative things associated with injustice began to occur." The study result indicates that workers do not clearly understand how their contributions are recognized and how rewards are distributed.

The reason for the low mean score in commitment is that workers are not satisfied with their wage level. The average hourly wage in the maquiladora is about $4. Although the daily wage for this organization is 25% more than the maquiladora average, workers only receive $5 a day for their hard work: just enough to support their family. In other words, they can only meet most basic needs with the current wage level. As a consequence, some workers may see and seek the opportunity to move to other manufacturers that will pay them more, which, in turn, results in low organizational commitment and a job turnover rate of 20% *in a month*.

Research that addresses the impacts of education on organizational commitment in the quality control circles in maquiladora manufacturers is

non-existence. This study investigated the impact of education on organizational commitment and found that workers with higher education are more likely to have higher organizational commitment when compared to workers with lower education. Workers with higher education perceived that the company has a great deal of personal meaning for them perhaps because they have reasoning and numerical abilities to solve problems in quality control circle activities when compared to workers with lower education.

Undoubtedly, workers in the organization encounter a dilemma: In general, workers are inexperienced and not highly paid, yet they are expected to perform to standards set by the best automobile manufacturers. Managers also face a dilemma: Managers encounter very young and inexperienced personnel, yet they are expected to lead workers to perform to standards and motivate workers to participate in the quality control circles.

Hypotheses Related to QCCs Performance

Six hypotheses examined the relationship between performance of quality control circles and (H4a) organizational commitment, (H4b) problem-solving environment, (H4c) TQM tools, (H4d) rewards, (H4e) communication, and (H4f) role of leader. Of the 6 hypotheses, 1 was supported: "The greater the perceived level of problem-solving environment, the higher the performance of QCCs." However, of the 4 problem-solving environment items, no single item was significantly related with QCCs performance.

QCCs performance used in this study was the 13 procedures of quality control circles measured by plant managers. It could be possible that some excellent teams completed a theme and just selected a new theme at the time the data was collected. In this case, their performance was only 3 of 13, meaning that they were in the stage of selection of QCC theme. Stated differently, the performance measure used in the study was a snap shot. Therefore, the long-term performance level of QCCs was not reflected in this study. Perhaps, different kinds of performance measure or longitudinal performance measure would provide results expected in the hypotheses. The nature of the performance measure likely highly influenced the results of the last hypothesis.

Limitations of the Research

Sample

The nature of the sample may raise some questions concerning sample selection bias. This refers to the systematic exclusion of subsets of the population. Any large bias may jeopardize both internal and external validity. Sample selection bias may have been introduced into the present study by collecting data only from one organization. Although the results of this study were obtained from an organization which provides automobile components to major automobile manufacturers in the U.S., one cannot be certain of the amount of bias present.

Performance Measure

The validity of a measure refers to the extent to which it measures what is intended to be measured. Although the performance measure used in this study was an *a priori,* it can be evaluated from content and predictive validity.

A measure has content validity if there is general agreement among the subjects and researchers that the instrument measurement items are saturated or they cover all aspects of variable being measured. Although the stage of the 13 procedures is an official performance measure used in the organization, other measure such as an individual performance level or the number of suggestions made by individuals may also reflect workers' creativity and innovation.

Predictive validity or criterion-related validity is concerned with the extent to which a measuring instrument is related to an independent measure of the relevant criterion. For instance, criterion-related validity of the 13 procedures of QCCs to predict future success of QCCs is high if the 13 procedures are highly correlated with actual performance of QCCs as measured by the organization. The 13 procedures of QCCs performance was the only measure available at the time the data was collected. In this sense, it can be argued that the measure was appropriate. However, the performance at the individual level or long-term QCCs performance, or a combination of multiple performance measures are recommended for the future study.

Generalizability of Results

The limitations of the sample and the performance measure used in this study make statements about TQM impacts in the maquiladora limited. The sample represents assembly line workers from an organization owned by a Japanese company that manufactures wire harnesses for automobiles. These results may not be generalizable to leaders, supervisors, managers, directors, and top management teams.

In addition, the education level of the sample was 38 workers with higher education and 115 workers with lower education. Although the impact of education was tested in the relationship between organizational commitment and satisfaction, rewards, and communication, generalizing the results of this study to a mixed group of workers with different education levels should be made cautiously.

Future Research

There are three major issues that show promise for further researched. First, further research can examine additional TQM factors and work outcomes at a different organizational level and determine if there are relationships between additional TQM factors and work outcomes. If additional TQM factors do not predict work outcomes, the next question is what do they predict. Including this study, most research examining work attitudes has been done on individuals within an organization. The future research can take a different approach and examine such relationships at the

organizational level of analysis. For instance, Ostroff (1992) examined the relationship between satisfaction, attitudes, and performance at an organizational level and found relationships between employee satisfaction and organizational performance.

Second, because some TQM tools are more used and require higher cognitive abilities than other tools, it would be interesting to investigate how quality control circles (QCCs) impact individuals' perceived abilities to use each TQM tool. For instance, the Pareto charts, cause-and-effect diagrams, and histograms are the most popular TQM tools (Kano, 1993) and they are pictorial aids for continuous improvement. On the other hands, statistical tools such as scatter diagrams and control charts are more complex than non-statistical techniques. Is there an impact of QCCs on individual members' perceived ability to use TQM tools? Also, do QCCs affect individuals' perceived abilities to use various TQM tools with the different education levels?

Third, researchers (Allen & Meyer, 1990; Meyer, Allen & Smith, 1993; Meyer & Allen, 1997) developed and improved scales to measure three components of organizational commitment: affective, continuance, and normative commitment. In this study, affective commitment was used as a measure of organizational commitment. Affective commitment (AC) refers to attachment to the organization such that the strongly committed individual identifies with, is involved in, and enjoys membership in the organization.

Normative commitment (NC) refers to commitment based on a moral belief or obligation that it is the right and moral thing to remain with the organization. Continuance commitment (CC) refers to a tendency to "engage in consistent lines of activity" (Becker, 1960, p. 33) on the basis of the individual's awareness of the costs. The future study could examine Meyer and Allen's scales for AC, CC, and NC (1993) in the Mexican workplace, a society quite different from the Western context in which the majority of research using the scales has taken place.

Implications for Managers

This study empirically investigated the relationships between the total quality management factors and work outcomes in a maquiladora. This study reflected the hierarchical nature of Mexican culture particularly in the relationship between a leader and members, suggesting that the Mexican culture may limit the effectiveness of total quality management. In this section, suggestions are offered in order to implement TQM techniques in the maquiladora.

First, TQM should be implemented according to the level of workers' experience, skills, and knowledge. TQM is a problem-solving approach which largely depends on reasoning and numerical abilities of members. Leaders and managers who have experience in QCCs should take initiatives in continuous improvement activities. For instance, they can show and train other leaders and workers how to use and apply statistical techniques, such

as control chart and scatter diagram. It should be emphasized that training needs to be provided periodically. Perhaps, it is more effective to focus on some quality control circles. People who are trained and have positive attitudes toward QCCs were influential and became key people to carry out TQM programs.

Second, perception of an inequitable outcome paired with an unfair decision rule encourages workers to seek the opportunity to move to other manufacturers. The study results may indicate that workers do not clearly understand how their contributions are recognized and how rewards are distributed. If the workforce is not stabilized, the organization will be continuously hiring and training new workers, making continuous improvement very difficult. Therefore, the organization needs to establish reward systems that workers perceive as fair in both distribution and procedure.

Third, managers need to choose people who have values and beliefs more consistent with the TQM philosophy. In any group of people, almost every value orientation will exist. According to Lawrence and Yeh (1994, p. 64), "Mexican culture lacks a strong belief regarding the virtuousness of acquiring skills and education." However, not every Mexican holds these exact beliefs and values. Therefore, managers can screen applicants for cultural beliefs, and choose applicants whose values and beliefs support the desired techniques.

Fourth, managers can modify the TQM techniques so that they are more consistent with Mexican cultural values. Johnson (1988) argues that Japanese firms in the U.S. modified manufacturing techniques for use in the U.S. culture by "[combining] the Japanese 'human capital' approach to labor relations and its longer term managerial perspective with the American emphasis on efficiency and objective job-performance criteria" (p. 36).

It is not suggested that managers change a worker's belief and value systems completely. Instead, the suggested changes can be achieved through the use of formal training programs, reviewing the human resource management approach, careful selection of TQM techniques, and the use of appropriate reward systems.

Conclusion

Researchers contend that there are relationships between TQM factors and work outcomes. However, TQM studies are limited to conceptual works (Crosby, 1979; Deming, 1986; Imai, 1986), or development of constructs (Ahire et al., 1996; Saraph et al., 1989; Zeitz et al., 1997) using U.S. samples. Others explored TQM or managerial aspects in Mexico but only from a cultural perspective (Lawrence & Yeh, 1994; Stephens & Greer, 1995). This study is a step in providing empirical information about the relationship between TQM factors and work outcomes in Mexico, particularly in the maquiladora.

The results of this dissertation provide information to individuals interested in better understanding attitudes toward satisfaction with work, satisfaction with leader, and organizational commitment in the maquiladora. It was found that clear, organized, and concise communication was important for organizational members to perceive job satisfaction.

The results from this study provide some empirical evidence of the hierarchical nature of Mexican culture. Organizational members expect a leader and supervisor to participate and take initiatives in TQM programs. The Mexican workers have great respect and expectations for a leader and his or her leadership in carrying out TQM programs. Further examination of the effect of hierarchical relationship between members and leaders in the maquiladora may provide important and practical findings for academicians and practitioners.

The results from this study are important because they provide more information about organizational commitment. It is still unclear why members who are satisfied with work and leader have low organizational commitment. It could be possible that workers were happy simply to have a job. Further examination of the effect of additional and cross-cultural factors on organizational commitment can provide practical information for organizations to stabilize their workforce.

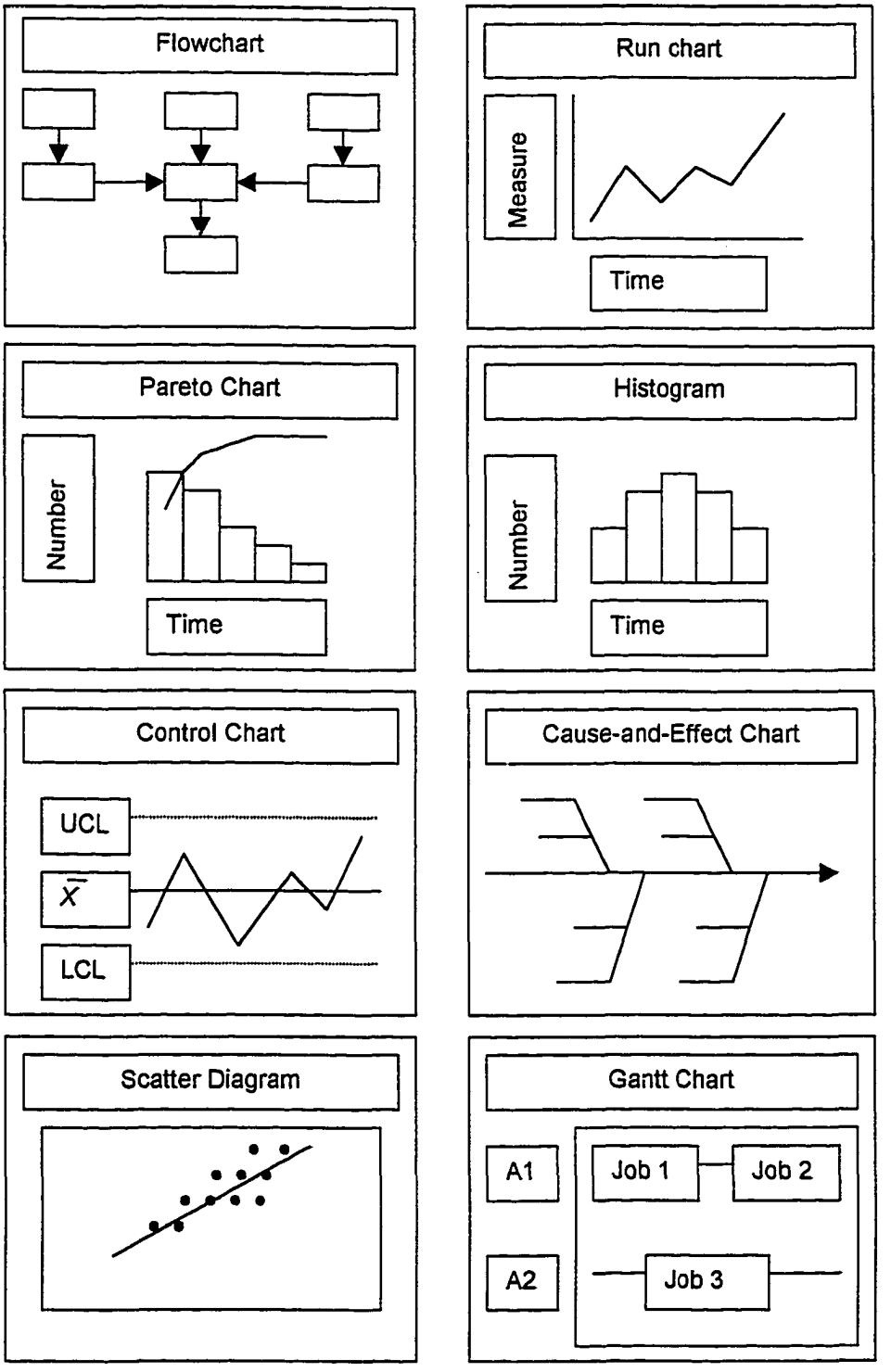
Despite limitations of this study, it contributes to the literature on TQM factors and their outcomes by examining the maquiladora workplace. The

results support and may simulate research in this area in a cross-cultural setting.

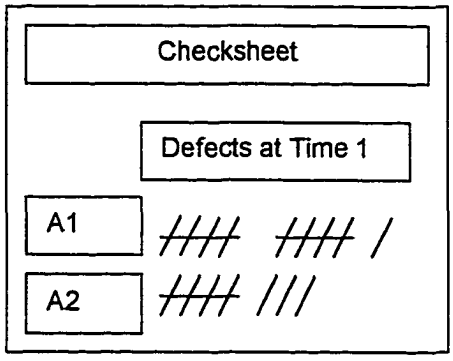
APPENDICES

APPENDIX A

TQM TOOLS



TQM TOOLS



APPENDIX B

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT

Independent Variables	Response Categories
Problem Solving Environment	
1. Members are encouraged to make suggestions for improvements in our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
2. People in my team are encouraged to try new and better ways of doing the job.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
3. Creativity is actively encouraged in this group.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
4. People in my team stay to the old, established ways of doing the work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
TQM Tools	
5. My team uses Fishbone (Cause-and-effect) diagram to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
6. My team uses Flowchart to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
7. My team uses Checksheet to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
8. My team uses Pareto chart to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
9. My team uses Brainstorming to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
10. My team uses Control chart to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
11. My team uses Scatter diagram to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
12. My team uses Histogram to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
13. My team uses Gantt chart to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
14. Our team uses Run chart to improve our work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT

Communication

15. Leader does a good job of communicating with members	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
16.There are effective communication channels between groups.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
17. I have opportunity to communicate with my leader.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
18. We get the information we need to do a good job.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
19. We have to rely on rumors for information.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always

Rewards

20. People in my team are rewarded for good work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
21. People in my group are paid fairly for the work that they do.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
22. Attempts are made to promote the people in my work unit who do good work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
23. Leader in my team gives credit to people who do good work.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
24. There are penalties for people in my group.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
25. There is quick recognition for people in my group for outstanding performance.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT

Role of Leader

26. Group leader assumes responsibility for quality performance.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
27. Leader is evaluated for quality performance.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
28. Leader supports long-term quality improvement.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
29. Leader participates in the quality improvement process.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
30. Leader has objectives for quality performance.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
31. We understand quality goals within the group.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
32. People in my group believe that quality and productivity is their responsibility.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always
33. People in my group share responsibility for the success or failure of our products.	❑Never ❑ Seldom ❑ Sometime ❑ Usually ❑ Always

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT

Dependent Variables[a]	Response Categories
Satisfaction with Leader	
34. The way my leader and I understand each other	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
35. The technical know-how of my leader	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
36. The way leader treats group members	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
37. The way my leader backs up the members	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
38. The way my leader handles complaints from members	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
39. The way my leader resolves scheduling conflicts and interpersonal conflicts.	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
Satisfaction with Work	
40. The ability to conduct my job the way I think it should be done.	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
41. The variety in my work	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
42. The freedom to use my own judgement	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
43. The feeling of accomplishment I get from the job.	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied
44. The opportunity to make a difference in the lives of others.	❑ Very satisfied ❑ Satisfied ❑ Neutral ❑ Dissatisfied ❑ Very dissatisfied

[a]All dependent variable items were reverse-coded.

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT

Organizational Commitment					
45. I would be very happy to spend the rest of my career with (company).	Agree ❑1	❑2	❑3	❑4	Disagree ❑5
46. I really feel as if (company's) problems are my own.	Agree ❑1	❑2	❑3	❑4	Disagree ❑5
47. I feel a strong sense of belonging to (company).	Agree ❑1	❑2	❑3	❑4	Disagree ❑5
48. I feel "emotionally attached" to (company).	Agree ❑1	❑2	❑3	❑4	Disagree ❑5
49. (company) has a great deal of personal meaning for me.	Agree ❑1	❑2	❑3	❑4	Disagree ❑5
50. It would be very hard for me to leave (company) now, even if I wanted to.	Agree ❑1	❑2	❑3	❑4	Disagree ❑5

Demographic Data	
Sex	❑Male ❑Female
Your nationality	❑Mexican ❑American
Marital status	❑Single ❑Married ❑Widow ❑Divorced
Your age	❑ less than 20 years old ❑ 20-25 ❑ 26-30 ❑ 31-35 ❑ 36-40 ❑ 41years old or older
I am working for this company for	❑ less than 1 year ❑1-2 years ❑2-3 years ❑ 3-4years ❑more than 4 years
Your plant	❑Plant A ❑Plant B ❑Plant C ❑Plant D ❑Plant E ❑Plant F
Your Quality Control Circle's name	_____
Last school grade attended?	❑ Never attended school ❑ Some elementary ❑ Elementary ❑ Some Junior high school ❑ Junior high school ❑ Some high school ❑ High school ❑ Some college/university ❑ University

APPENDIX C

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT (SPANISH)

Problem Solving environment

1. Los miembros en el grupo, son alentados para realizar sugerencias de mejoramientos sobre el trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
2. Las personas en mi equipo son alentadas a intentar nuevas y mejores formas de hacer el trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
3. La creatividad es activamente alentada en este grupo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
4. Las personas de mi equipo ó area se apegan demasiado a los viejos metodos de trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

TQM Tools

5. Mi equipo usa el diagrama de pescado (causa-efecto) para mejorar el trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
6. Mi equipo usa diagramas de flujo para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
7. Mi equipo usa hojas de chequeo (reportes) para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
8. Mi equipo usa gráficas de Pareto para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
9. Mi equipo usa tormenta de ideas para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
10. Mi equipo usa gráficas de control para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
11. Mi equipo usa gráficas de correlación para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
12. Mi equipo usa gráficas de barras para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
13. Mi equipo usa gráficas de Gantt (ó planificación de actividades) para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
14. Mi equipo usa gráficas de % de defectos para mejorar nuestro trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT (SPANISH)

Communication

15. El lider hace un buen trabajo al comunicarse con los miembros. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

16. Tenemos canales ó formas efectivas para comunicarnos entre los grupos. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

17. Tengo la oportunidad de comunicarme con mi lider ó supervisor. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

18. Obtenemos la informacion necesaria para hacer un buen trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

19. Tenemos que depender de rumores para contar con información. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

Rewards

20. A las personas dentro de mi equipo se les recompensa (en forma material o moralmente) por su buen trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

21. Las personas en mi grupo reciben un pago justo por el trabajo que ellos desempeñan. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

22. En mi área se realizan intentos para promover a las personas que realizan un buen trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

23. El lider en mi equipo reconoce a las personas que realizan un buen trabajo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

24. Se aplican castigos o sanciones al personal de mi grupo. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

25. Se da reconocimineto de inmediato a las persona dentro de mi grupo, cuando hacen un trabajo sobresaliente. ❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

Role of Leader

26. El líder del grupo asume la responsabilidad para trabajar con calidad.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
27. El líder es evaluado en base a la calidad de su área.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
28. El líder apoya mejoramientos de calidad a largo plazo.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
29. El líder participa en el proceso del mejoramiento de la calidad.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
30. El líder tiene metas u objetivos para la calidad del trabajo en su área.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
31. Entendemos las metas y objetivos de calidad dentro del grupo.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
32. Las personas en mi grupo sostienen que la calidad y eficiencia son su responsabilidad.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre
33. Las personas en mi grupo comparten la responsabilidad para el éxito o fracaso (fallas) de nuestros productos.	❑ nunca ❑ raramente ❑ a veces ❑ nórmalmente ❑ siempre

Satisfaction with Leader

34. La forma en que mi líder/supervisor y yo nos entendemos mutuamente.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
35. La forma en que el conocimiento técnico de mi líder para hacer el trabajo.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
36. La forma en que el líder trata a los miembros del grupo.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
37. La forma en que mi líder ayuda a los miembros del grupo.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
38. La forma en que mi líder maneja las quejas de los miembros.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
39. La forma en que mi líder resuelve conflictos de la programación y conflictos interpersonales.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho

Satisfaction with Work

40. Mi capacidad para ejecutar el trabajo en la forma que pienso debe ser hecho.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
41. La variedad en mi trabajo.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
42. La libertad para usar mi propio juicio.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
43. Mi sentimiento de realización que obtengo al hacer mi trabajo.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho
44. La oportunidad para hacer una diferencia en la vida de otros.	❑ Muy satisfecho ❑ Satisfecho ❑ Regular ❑ Insatisfecho ❑ Muy insatisfecho

SURVEY QUESTIONNAIRE OF QUALITY MANAGEMENT (SPANISH)

Organizational Commitment					
45. Sería muy feliz trabajando el resto de mi carrera en (company).	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1
46. Realmente siento como si los problemas de (company) fueran los mios propios.	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1
47. Siento un fuerte sentido de ser una parte de (company).	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1
48. Me siento "emocionalmente unido" a (company).	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1
49. (Company) tiene un gran significado personal para mi.	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1
50. Seria muy difícil para mí dejar a (company) ahora, aún si yo mismo lo deseara.	De acuerdo ❑5	❑4	❑3	❑2	En desacuerdo ❑1

Demographic Variables	
Sexo	❑Masculino ❑Femenino
Nacionalidad	❑Mexicano ❑Americano
Estado civil	❑Soltero ❑Casado ❑Viuda ❑Divorciado
Qué edad tiene?	❑ Menor de 20 años ❑21 – 25 ❑26-30 ❑31-35 ❑36 – 40 ❑41 o más
He trabajado para esta compania por	❑ Menos de 1 año ❑1-2 años ❑2-3 años ❑ 3-4 años ❑ más de 4 años
Su planta	❑Planta A ❑Planta B ❑Planta C ❑Planta D ❑Planta E ❑Planta F
Nombre de su Circulo de Calidad	_____
Ultimos estudios?	❑ No fui a la escuela ❑ Algunos años de Primaria ❑ Primaria ❑ Algunos años de Secundaria ❑ Secundaria ❑ Algunos años de Preparatoria ❑ Preparatoria ❑ Algunos años de Universidad ❑ Universidad

REFERENCES

Ahire, S.L., Golhar, D.Y., & Waller, M.A. (1996). Development and validation of TQM implementation constructs. Decision Sciences, 27(1), 23-56.

Aldridge, J.R., Taylor, J., & Dale, B.G. (1991). The application of failure mode and effects analysis at an automotive components manufacturer. International Journal of Quality and Reliability Management, 8(3), 45-56.

Allen, N., & Oakland, J.S. (1991). Quality insurance in textile industry: Part III. International Journal of Quality and Reliability Management, 8(2), 9-20.

Allen, N.J., & Meyer, J.P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. Journal of Occupational Psychology, 63(1),1-18.

Allen, T.D. & Rush, M.C. (1998). The effects of organizational citizenship behavior on performance judgements: A field study and a laboratory experiment. Journal of Applied Psychology, 83(2), 247-260.

Anderson, J.C., Rungtusanatham, M., & Schroeder, R.G. (1994). A theory of quality management underlying the Deming management method. Academy of Management Review, 19(3), 472-509.

Angle, H. & Perry, J. (1981). An empirical assessment of organizational commitment and organizational effectiveness. Administrative Science Quarterly, 26(1), 1-14.

Angle, H. (1983). Organizational commitment: Individual and organizational influences. Sociology of Work and Occupations, 10(2),123-146.

Bacon, C.C. (1980). Communication related contributors of job satisfaction: An analysis of ambiguity in job-related messages. Paper presented at the Eastern Communication Association Convention, Ocean City, MD.

Barra, R.J. (1983). Putting quality circles to work. New York, NY: McGraw-Hill.

Basadur, M. (1992). Managing Creativity: A Japanese Model. The Academy of Management Executive, 6(2), 29-42

Bateman, T.S., & Strasser, S. (1984). A longitudinal analysis of the antecedents of organizational commitment. Academy of Management Journal, 27(1),95-112.

Becker, H.S. (1960). Note on the concept of commitment. American Journal of Sociology, 66(1), 32-42.

Benson, P.G., Saraph, J.V., & Schroeder, R.G. (1991). The effects of organizational context on quality management: An empirical investigation. Management Science, 37(9), 1107-1124.

Berg, D. H. (1995). The power of a playful spirit at work. The Journal for Quality and Participation, 18(4), 32 -38

Berman, S.J., & Hellweb, S.A. (1989). Perceived supervisor communication competence and supervisor satisfaction as a function of quality circle participation. The Journal of Business Communication, 26(2), 103-122.

Bhote, K.R. (1989). America's quality health diagnosis: Strong heart, weak head. Management Review, 78(5), 34-38.

Bourgeois, L.J. III & Boltvinic, M. (1981). Organizatioal development in crosscultural settings: Latin America. California Management Review, 23(3), 75-81.

Brislin, R. (1980). Translation and content analysis of oral and written materials. In H.C. Triandis & J.W. Berry (Eds.), Handbook of Cross-Cultural Psychology (pp. 380-444). Boston, MA: Allyn & Bacon.

Brook, J.A., & Brook, R.J. (1989). Exploring the Meaning of Work and Nonwork. Journal of Organizational Behavior, 10(2), 169-168.

Buller, D., Moore, L., Luttrell, K., & Furr, S. (1981). A look at the central concept of participative management and its impact on job satisfaction in an academic work environment. Paper presented at the Eastern Communication Association Convention, Pittsburgh.

Caldwell, D.E., Chatman, J.A., & O'Reilly, C.A. (1990). Building organizational commitment: A multifirm study. Journal of Occupational Psychology, 63(3), 245-261.

Casagrande, J. (1954). The ends of translation. International Journal of American Linguistics, 20, 335-340.

Cegala, D.J., Savage, G.T., Brunner, C.C. & Conrad, A.B. (1982). An elaboration of the meaning of interaction involvement: Toward the development of a theoretical concept. Communication Monographs, 49(4), 229-248.

Chapman, R.L., Clarke, P., & Sloan, T. (1991). TQM in continuous-process manufacturing: Dow-Corning (Australia) Pvt. Ltd. International Journal of Quality and Reliability Management, 8(5), 77-90.

Churchill, G.A. (1979). A paradigm for developing better measures of marketing constructs, Journal of Marketing Research, 21(1), 64-73.

Clampitt, P G., & Downs, C. W. (1993). Employee perceptions of the relationship between communication and productivity. The Journal of Business Communication, 30(1), 5-28.

Cole, R.E. (1980) Learning from the Japanese: Prospects and pitfalls. Management Review, 69(9), 22-28.

Cole, R.E. (1983). Improving product quality through continuous feedback. Management Review, 72(10), 8-12.

Cole, R.E. (1990). U.S. quality improvement in the auto industry: Close, but no cigar. California Management Review, 35(3),7-11.

Cook, J., & Wall, T. (1980). New work attitude measures of trust, organizational commitment and personal need non-fulfillment. Journal of Occupational Psychology, 53(1), 39-52.

Costley, D.L., Santana-Melgoza, C., & Todd, R. (1994). Human relations in organizations. St. Paul, MN: West Publishing Company.

Cotton, J.L. & Tuttle, J.M. (1986). Employee turnover: A meta-analysis and review with implications for research, Academy of Management Review, 11(1), 55-70.

Cropanzano, R. & Folger, R. (1996). Procedural justice and worker motivation. In R.M. Steers, L.W. Porter, & G.A. Bigley (Eds.), Motivation and Leadership at Work (pp. 72-83). New York, NY: McGraw-Hill.

Crosby, P.B. (1979). Quality is free: The art of making quality certain. New York, NY: McGraw-Hill.

Dawson, P., & Patrickson, M. (1991).Total quality management in Australian banking industry. International Journal of Quality and Reliability Management, 8(5), 66-76.

Dean, J.W., & Bowen, D.E. (1994). Management theory and total quality: Improving research and practice through theory development. Academy of Management Review, 19(3),392-418.

Dean, J.W. & Evans, J.R. (1994). Total quality: Management, organization, and strategy. Minneapolis, MN: West.

Deming, W.E. (1981). Improvement of Quality and Productivity through Action by Management. National Productivity Review, 1(1),12-22.

Deming, W.E. (1986). Out of crisis. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.

Downey, H.K., Hellriegel, D., & Slocum, J.W. (1975). Congruence between individual needs, organizational climate, job satisfaction, and performance. Academy of Management Journal , 18(1), 149-155.

Downs, A. (1991). A case study of the relationship between communication satisfaction and organizational commitment in two Australian organizations. Unpublished master's thesis, University of Kansas, Lawrence, KS.

Downs, C. W., Downs, A., Potvin, T., Varona, E, Gribas, J. S., & Ticehurst, W. (1995). A cross-cultural comparison of relationships between organizational commitment and organizational communication. Paper presented at the International Communication Association Convention, Albuquerque, NM.

Ebrahimpour, M. (1985). An examination of quality management in Japan: Implications for management in the United States. Journal of Operations Management, 5(4), 419-431.

Ebrahimpour, M., & Withers, B.E. (1992). Employee involvement in quality improvement: A comparison of American and Japanese manufacturing firms operating in the U.S. IEEE Transactions on Engineering Management, 39(2),142-148.

Engardio, P. (1994, November 18). A hothouse of high-tech talent. Business Week, 3399, 126.

Falcione, R.L., McCroskey, J.C., & Daly, J.A. (1977). Job satisfaction as a function of employees' communication apprehension, self-esteem, and perceptions of their immediate supervisors. In B.Ruben (Ed.), Communication Yearbook. (pp. 383-375). New Brunswick, NJ: Transaction-International Communication Association.

Finch, B.J. & Luebbe, R.L. (1995). Operations Management. Orlando, FL: Harcourt Brace & Company.

Gartner, W.B., & Naughton, M.J. (1988). The Deming theory of management. Academy of Management Review, 13,138-142.

Garvin, D.A. (1983). Quality on the line. Harvard Business Review, 61(5), 65-75.

Garvin, D.A. (1984). Japanese quality management. Columbia Journal of World Business, 19(3), 3-12.

Garvin, D.A. (1986). Quality problems, policies and attitudes in the United States and Japan: An exploratory study. Academy of Management Journal, 29(4), 653-673.

Garvin, D.A. (1987). Competing on the eight dimensions of quality. Harvard Business Review, 65(6),101-109.

Gillespie,K., & Teegen, H.J. (1995). Market liberalization and international alliance formation: The Mexican paradigm. Columbia Journal of World Business, 30(4), 58-69.

Hackman, J.R., & Oldham, G.R. (1980). Work Redesign. Reading, MA: Addison-Wesley.

Hackman, J.R., & Wageman, R. (1995). Total quality management: Empirical, conceptual, and practical issues. Administrative Science Quarterly, 40, 309-342.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). Multivariate data analysis. Upper Saddle River, NJ: Prentice Hall.

Hall, H.H. (1985). Professional/Management relations: Imagery vs. action. Human Relations management, 24(2), 227-236.

Harmon, L.K. (1988). Total quality and the management of performance improvement. SAM Advanced Management Journal, 53(4), 4-12.

Herzberg, F. (1966). Work and the nature of man. Cleveland, OH: World.

Hofstede, G. (1980). Culture's consequence. Beverly Hills, CA:Sage Publications.

House, R.J. & Rizzo, J.R. (1972). Toward the measurement of organizational practices: Scale development and validation. Journal of Applied Psychology, 56(5), 388-396.

Hull, C.H., & Nie, N.H. (1981). SPSS update. New York, NY: McGraw-Hill

Hunt, V.D. (1992). Quality in America. Homewood, IL: Irwin.

Imai, M. (1986). Kaizen. New York, NY: McGraw-Hill.

Imai, M. (1997). Gemba Kaizen. New York, NY: McGraw-Hill.

Ishikawa, K. (1985). Guide to quality control. Tokyo: Asian Productivity Organization.

Jablin, F.M. (1987). Organizational entry, assimilation, and exit. In F.M. Jablin, L.L.Putnam, K.H. Roberts, & L.W. Porter (Eds.), Handbook of organizational communication (pp.679-740). Newbury Park, CA: Sage.

Jacoby, J., Troutman, T., Muzursky, D., & Kuss, A. (1984). When feedback is ignored: Disutility of outcome feedback. Journal of Applied Psychology, 69(3), 531-545.

Johnson, C. (1988). Japanese style management in America. California Management Review, 30(4), 34-45.

Johnson, P.L. (1993). ISO9000: Meeting the new international standards. New York, NY: McGraw-Hill.

Jones, A.P., & James, L.R. (1979). Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions. Organizational Behavior and Human Performance, 23,201-250.

Juran, J.M (1989). Juran on leadership for quality. New York, NY: Free Press.

Kalleberg, A.L. (1977). Work values and job rewards: A theory of job satisfaction. American Sociological Review, 42(1),124-143.

Katz, R., & Van Maanan, J. (1977). The loci of work satisfaction: Job interaction, and policy. Human Relations, 30(5), 469-486.

Katzell, R.A. (1979). Changing attitudes toward work. In Work in America. New York, NY: Van Nostrand.

Kipnis, D., Schmidt, S.M., Swaffin-Smith, C. & Wilkinson, I. (1984). Patterns of managerial influence: Shotgun manages, tacticians and bystanders. Organizational Dynamics, 13, 58-67.

Krackhardt, D., McKenna, J., Porter, L.W., & Steers, R.M. (1981). Supervisory behavior and employee turnover: A field experiment. Academy of Management Journal, 24(2), 249-259.

Kano, N. (1993). A perspective on quality activities in American firms. California Management Review, 35(3), 12-31.

Kolland, F. (1990). National cultures and technology transfer: The influence of the Mexican lifestyle on technology adoption. International Journal of Intercultural Relations, 14(3), 319-336.

Kras, E.S. (1989). Management in two cultures: Bridging the gap between U.S. and Mexican managers. Yarmouth, ME: Intercultural Press,

Lance, C.E. (1991). Evaluation of a structural model relating job satisfaction, organizational commitment, and precursors of voluntary turnover. Multivariate Behavioral Research, 26, 137-162.

Lawler, E.E. (1981). Pay and organization development. Reading, MA: Addison-Wesley Publishing.

Lawrence, J.J. & Yeh, Ryh-song. (1994). The influence of Mexican culture on the use of Japanese manufacturing techniques in Mexico, Management International Review, 34(1), 49-66

Locke, E.A. (1969). What is job satisfaction? Organizational Behavior and Human Performance, 4(4),309-336.

Locke, E.A. (1984). Job satisfaction. In M. Gruneberg & T. Wall (Eds.), Social Psychology and Organizational Behavior (pp. 93-117). New York, NY: John Wiley & Sons.

Locke, E.A., Shaw, K.M., Saari, L.M., & Latham, G.P. (1981). Goal setting and task performance: 1969-1980. Psychological Bulletin, 90(1), 125-152.

Luthans,F., & Thompson, K.R. (1987). Theory D and O.B. mod.: Synergistic or opposite approaches to performance improvement? Journal of Organizational Behavior Management, 9(1),105-124.

Mathieu, J.E., & Zajac, D. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. Psychological Bulletin,108(2),171-194.

McDermott, T. (1994). TQM: The total quality maquiladora. Business Mexico, 4(11), 42-45.

Meyer, J.P., Allen, N.J., & Gellatly, I.R. (1990). Affective and Continuance Commitment to the Organization: Evaluation of Measures and Analysis of Concurrent and Time-Lagged Relations. Journal of Applied Psychology, 75(6),710-720.

Meyer, J.P., Allen, N.J., & Smith, C.A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. Journal of Applied Psychology, 78(4), 538-551.

Meyer, J.P., & Allen, N.J. (1997). Commitment in the workplace: Theory, research and application. Thousand Oaks, CA: Sage.

Milkovich, G.T. & Newman, J.M. (1993). Compensation, 4th ed. Homewood, IL: Irwin.

Mizuno, S. (1988). Management for quality improvement: The seven new QC tools. Cambridge, MA: Productivity Press.

Modarress, B., & Ansari, A. (1989). Quality control techniques in U.S. firms: A survey. Production and Inventory Management Journal, 30(2), 58-62.

Morrison, E.W. (1994). Role definitions and organizational citizenship behavior: The importance of the employee's perspective. Academy of Management Journal, 37(6), 1543-1567.

Morse, N.C. (1953). Satisfaction in the white-collar job. Ann Arbor, MI: University of Michigan Survey Research Center.

Morrow, P.C. (1997). The measurement of TQM principles and work-related outcomes. Journal of Organizational Behavior, 18(4), 363-376.

Mowday, R.T., Porter, L.W., & Steers, R.M. (1982). Employee-organization linkages. New York, NY: Academic Press.

Nunnally, J. (1967). Psychometric theory. New York, NY: McGraw-Hill.

Nie, N.H., Hull, C.H., Jenkins, J.G., Steinbrenner, K., & Bent, D.H. Statistical Package for the Social Sciences (2nd ed.), New York, NY: McGraw-Hill, 1975.

Oliver, N. (1988). Employee commitment and total quality control. International Journal of Quality and Reliability Management, 7(1),21-29.

Ostroff, C. (1992). The relationship between satisfaction, attitudes, and performance: An organizational level analysis. Journal of Applied Psychology, 77(6),963-974.

Pfeffer, J. (1977). The ambiguity of leadership. Academy of Management Review, 2(1), 104-112.

Phillips, L.W., Chang, W.D., & Buzzell, R.D. (1983). Quality, cost position and business performance: A test of some key hypotheses. Journal of Marketing, 47(2), 26-43.

Pincus, D. (1985, May). The impact of organizational communication on job satisfaction and job performance. Paper presented at the International Communication Association Convention, Honolulu, HI.

Pinder, C. (1998). Beliefs, attitudes and emotions at work. In Craig C.Pinder, Work Motivation in Organizational Behavior, (pp. 241-284). Upper Saddle River, NJ: Prentice Hall.

Pritchard, R., & Karasick, B. (1973). The effects of organizational climate on managerial job performance and job satisfaction. Organizational Behavior and Human Performance, 9, 110-176.

Potvin, T. C. (1991). Employee organizational commitment: An examination of its relationship to communication satisfaction and evaluation of questionnaires designed to measure the construct. Unpublished doctoral dissertation, University of Kansas, Lawrence, KS.

Putti, J. M., Aryee, S., & Phua, J. (1990). Communication relationship satisfaction and organizational commitment. Group & Organizational Studies, 15(1), 44-52.

Reichers, A.E. (1985). A review and reconceptualization of organizational commitment. Academy of Management Review, 10, 465-467.

Richmond, V.P., McCroskey, J.C. (1979). Management communication style, tolerance for disagreement and innovativeness as predictors of employee satisfaction: A comparison of single-factor, two-factor, and multiple-factor approaches. In D.Nimmor(Ed.), Communication Yearbook 3, (pp. 359-373). New Brunswick,NJ: Transaction Books.

Roberts, K.H. & O'Reilly, C.A. (1979). Some correlates of communication roles in organizations. Academy of Management Journal, 22(1), 42-57.

Robinson, A.G., & Schroeder, D.M. (1990). The limited role of statistical quality control in a zero-defect environment. Production and Inventory Management Journal, 31(3), 60-65.

Roth, A.V., & Miller, J.G. (1992). Success factors in manufacturing. Business Horizons, 35(4), 73-81.

Sager, J.K. & Johnston, M.W. (1989). Antecedents and outcomes of organizational commitment: A study of salespeople. Journal of Personal Selling & Sales Management, 9(1), 30-41.

Saraph, J.P., Benson, G., & Schroeder, R. (1989). An instrument for measuring the critical factors of quality management. Decision Sciences, 20(4), 810-829.

Schaffer, R., & Tompson, H. (1992). Successful change programs begin with results. Harvard Business Review, 70(1), 80-89.

Schroeder, R.G., Sakakibara, S., Flynn, E.J., & Flynn,B.B. (1992). Japanese plants in U.S.: How good are they? Business Horizons, 35(4), 66-72.

Smith, P., Kendall, L., & Hulin, C. (1969). The measurement of satisfaction in work and retirement. Chicago,IL: Rand McNally.

Snizek, W.E. (1972). Hall's professionalization scale: An empirical reassessment. American Sociological Review, 37(1), 109-114.

Steers, R.M. (1977). Antecedents and outcomes to organizational commitment. Administrative Science Quarterly, 22(1), 46-56.

Steers, R., & Porter, L.W. (1983). Employee commitment to organizations. In R.M. Steers & L.W. Porter (Eds.), Motivation and work behavior, (pp. 441-451). New York, NY: McGraw-Hill.

Stephens, G.K., & Greer,C.R. (1995). Doing business in Mexico: Understanding cultural differences. Organizational Dynamics, 24(1), 39- 54.

Stevens, M.J. & Campion, M.A. (1999). Staffing work teams: Development and validation of a selection test for teamwork settings. Journal of Management, 25(2), 207-228.

Stoddard, R.R. (1987). Maquila: Assembly Plants in Northern Mexico. El Paso, TX: Texas Western Press.

Stohl, C. (1986). Bridging the parallel organization: A study of quality circle effectiveness. Paper presented at the International Communication Association Convention, Chicago, IL.

Stumpf, S.A. & Hartman, K. (1984). Individual exploration to organizational commitment or withdrawal. Academy of Management Journal, 27(2), 308-329.

Tersine, R.J., & Riggs, W.E. (1976). The Delphi technique: A long-range planning tool. Business Horizons, 19(2), 51-56.

Tolchin, M., & Tolchin, S. (1988). Buying into America. New York, NY: Time Books.

Trompenaars, F. (1994). Riding the Waves of Culture: Understanding Diversity in Global Business. Chicago, IL: Irwin Professional Publishing.

Vanora, F. (1996). Relationship between communication satisfaction and organizational commitment in three Guatemalan organizations. The Journal of Business Communication, 33(2),111-140.

Vroom, V. (1964). Work and motivation. New York, NY: John Wiley & Sons.

Villa, J.R. (2000). Boundary behavior of organizational leaders: Definition and scale development. Unpublished Dissertation, New Mexico State University.

Waldman, D.A. (1994). The contributions of total quality management ot a theory of work performance. Academy of Management Review, 19(3), 510-536.

Wallace, J. E. (1995). Organizational and professional commitment in professional and nonprofessional organizations. Administrative Science Quarterly, 40(2), 228-255

Walton, M. (1991). Deming management at work. New York, NY: The Berkley Publishing Group.

Weiss, D.J., Dawis, R.V., England, G.W. & Lofquist, L.H. (1967). Manual for the Minnesota Satisfaction Questionnaire. Minnesota Studies in Vocational Rehabilitation: XXII Minneapolis. University of Minnesota Industrial Relations Center Work Adjustment Project.

Werner, O., & Campbell, D. 1970. Translation, working through interpreters and the problem of decentering. In R. Naroll & R. Cohen (Eds.), A handbook of method in cultural anthropology, (pp. 398-420). New York, NY: Natural History Press.

Wheeless, L.R., Wheeless, V.E., & Howard, R.D. (1984). The relationships of communication with supervisor and decision-participation to employee job satisfaction. Communication Quarterly, 32, 222-232.

Whetten, D.A. (1989). What constitutes a theoretical contribution? Academy of Management Review, 14(4), 490-495.

Wollner, G.E. (1992). The law of producing quality. Quality Progress, (January), 35-40.

Zeitz, G., Johannesson, R., & Ritchie Jr, J.E. (1997). An employee survey measuring total quality management practices and culture, Group & Organization Management, 22(4), 414-444.