The Psychological Typologies and Leadership Behaviors of First-Line Supervisors in a Large Automotive Company

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THE PSYCHOLOGICAL TYPOLOGIES AND LEADERSHIP BEHAVIORS OF FIRST-LINE SUPERVISORS IN A LARGE AUTOMOTIVE COMPANY

by

James Joseph Conlen

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Education Department of Educational Leadership

Western Michigan University Kalamazoo, Michigan April 1992
The purpose of this study was to examine the psychological typologies and leadership behaviors related to participative management of first-line supervisors in a plant of a large automotive company. The Myers-Briggs Type Indicator (MBTI, Myers & McCaulley, 1985) was used as a measure of psychological typologies. The Group Environment Scale (GES, Moos, 1974) was used as a measure of leadership behaviors. The population was 113 first-line supervisors; complete data were obtained for 76 supervisors (67%).

Hypotheses were formulated upon the expectation that GES mean scores would differ depending upon MBTI personality type. Twelve directional hypotheses were investigated using four MBTI functions—sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT)—as the independent variable; mean GES scores on the relationship dimension, personal growth dimension, and system maintenance and system change dimension were dependent variables.

The functions of the MBTI from this group of supervisors were compared to the GES dimensions using chi square and a one-way analysis of variance (ANOVA). Demographic data were also compared to the
MBTI and GES using a two-way analysis of variance, and no findings were significant ($p = .01$).

The first-line supervisors in this study were similar to other comparable populations for which normative data on the MBTI are available. The only major exception was the low number of NFs, which represented 2.5% of the population rather than the expected range of from 8% to 18%.

The mean scores for supervisors on the GES were comparable to the normative data available on this instrument. Supervisors in this population, based upon their perception of their leadership behaviors, were very similar to other leaders of groups.

The findings of this study do not support the existence of a meaningful relationship between personality type and participative leader behaviors. Despite these findings this relationship may merit further investigation. A flaw in this study was the lack of an adequate number of NFs to permit statistical analysis. Future studies should control for this omission.
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The psychological typologies and leadership behaviors of first-line supervisors in a large automotive company

Conlen, James Joseph, Ed.D.

Western Michigan University, 1992
DEDICATION

To my children: Michael, Kathryn, John, and Matthew.

James Joseph Conlen
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CHAPTER I

THE PROBLEM

Introduction

Participative management is a form of leadership behavior encouraged by many large industrial corporations. The movement from an autocratic to a more participative leadership is being driven by demands placed upon the company, the union, and the work force caused by increased competition, the need for quality and productivity improvements, and new technology. Based upon the premise that the environment of a work group has an impact upon the people within the group (C. I. Barnard, 1938; Moos, 1974), the corporation being studied in this research is making an effort to increase work motivation through participation in the decision-making process.

Large industrial corporations are requiring supervisors to change from autocratic leaders to participative leaders, and tensions and difficulties exist in making this change. One of the clearest examples of these difficulties is the relationship of first-line supervisors to the people above and below them (Klein, 1988). While first-line supervisors are seen as an integral force in implementing this new participative leadership, they are the group least consulted when planning for the change (Roethlisberger, 1965). The desired change in behavior on the part of first-line supervisors is more than an operational rearrangement. Organizations need to
understand that a behavioral change, for instance, from an autocratic to a participative set of behaviors, involves the supervisor's personality, attitudes, and values, and that such change is a function of an individual's personality related primarily to motivation and the environment (C. I. Barnard, 1938; Lewin, 1935).

Need for the Study

Do certain personality types have more success in creating participative leadership environments? First-line supervisory work has generally been performed by individuals, the majority of whom were of sensing thinking (ST) types (Myers & McCaulley, 1985). If the new role of the supervisor is to be the leader of a participative type work group, rather than an orders-from-the-top-down work group, then more intuitive feeling (NF) type behaviors are needed, since NFs are generally the most participative leaders (Myers & Myers, 1980).

The corporation in this research has set up a participative environment which attempts to maximize particular behaviors, based on the premise that the social environment of a work group has an impact upon the individuals within it (C. I. Barnard, 1938; Lewin, 1935; Moos, 1974). Little, if any, research has been done on the fit between the personality type of first-line supervisors and the behaviors needed by them to successfully implement participative leadership. The plant in this study is a part of a large industrial corporation which manufactures engines. The population was 113 first-line supervisors who directly supervised hourly employees.
Seventy-six supervisors completed all aspects of the study.

There are three constructs associated with participative leader behaviors: membership in a work group, group autonomy in making decisions, and goal setting by the group (Hinckley, 1985; Kanter, 1983; Sashkin, 1982). These constructs are comparable to the three dimensions of the Group Environment Scale (GES) as described by Moos (1974): membership in the work group (relationship dimension), group autonomy (personal growth dimension), and participation in goal setting (system maintenance and system change dimension). (See Chapter II, page 48.) Thus, based upon the accepted definition of the GES subscales, each of the three dimensions relates to the concept of participative leader behaviors associated with each of the constructs: membership within the work group, group autonomy, or group goal setting (see Chapter II). The developer, Moos (1990), supported the interpretation of this instrument as a measure of participative leader behaviors. Moos (1990) stated: "By conceptualizing participative management as involving the three dimensions of the GES measured by the subscales, the GES measures participative leader behaviors."

The results from this study should be generalizable to other populations of supervisors and task oriented leaders. They may also provide a model for studying other plants or work groups. This information may be helpful to the company in planning for future training programs, planning for implementation of the participative change process, and may be helpful in selecting personnel for teams to implement the desired change.
Purpose of the Study

According to normal type development concepts, each person has a preferred way of taking in information (perception): either sensing (S) or intuition (N), and a preferred mode of decision making (judgment), either thinking (T) or feeling (F) (Jung, 1923/1971). Collectively these four mental processes are referred to as the "functions." The concept of psychological type, developed by Jung and refined by Myers and Briggs, connotes a dynamic rather than a static condition (McCaulley, 1981). With the proper reinforcement each psychological type develops increasing skill and satisfaction governed primarily by using the preferred function. An inability to use the preferred function results in a primitive or undifferentiated personality (Jung, 1923/1971). Many destructive conflicts arise when an individual who prefers one set of functions is regularly using opposite kinds of perception and judgment. This conflict can extend to a job when the worker's natural preference for perception and judgment is thwarted (Myers & Myers, 1980).

The confusion about and lack of support for participative management by supervisors may be caused in part by the assumption that participative leader behaviors require a different combination of personality functions than some supervisors prefer to exhibit. When these supervisors use a combination of the perception and judgment functions other than their preferred choice, conflicts may result. This conflict in the use of preferred functions may cause serious problems for such supervisors (Myers & Myers, 1980).
The conceptual hypothesis of this study is that there is a relationship between personality type and leadership behaviors related to participative management. This study examined a set of research questions regarding this relationship. These questions were formulated into 12 hypotheses, as stated in the specific hypotheses section, describing the relationship between the Myers-Briggs Type Indicator (MBTI, Myers & McCaulley, 1985) types and the GES scores of auto plant supervisors.

Delimitations

The following limitations of this study need to be kept in mind: First, the size of the sample used was 76 (67%) from a total population of 113 (all the first-line supervisors in one automotive plant).

Second, all participants were volunteers, rather than randomly identified. Volunteers are different from nonvolunteers, which may compromise the interpretation and generalizability of results (Isaac & Michael, 1985).

Third, as with all correlational studies, there is no expectation nor interpretation of causation to be made.

Fourth, this study is limited to studying the relationship between personality type and participative leadership behaviors. There is no intent to study outcomes, such as productivity, quality, profitability, or attendance.

Fifth, some intervening variables, such as layoffs, overtime, plant closings, and retirements, could not be controlled for and may
have influenced the first-line supervisors' responses on the MBTI and GES by creating negative feelings or influences.

Sixth, each of the instruments, the MBTI and the GES, is self-reporting and contains some measurement error. Neither instrument is representative of an exacting science; and as a consequence, only results significant at the .01 level were considered.

Theoretical Framework

Basic Assumptions

In order to understand the basis upon which this study was undertaken, the following assumptions must be kept in mind: First, participative leadership encourages supportive relationships, group decision making, and high performance goals (Likert, 1967), which may help groups in complying with and implementing the decisions made by the group (Lewin, 1948).

Second, differences in personality make some individuals fit better in groups that require responsibility for and active involvement in the decision-making process (Vroom, 1964). Productive organizations are cooperative and dependent upon developing shared goals between the organization and the people in the organization (C. I. Barnard, 1938).

Third, the GES (Moos, 1974) was chosen as a measure of leadership behaviors related to participative management because the descriptions of the 10 subscales closely approximate the constructs of leader behavior as related to the definition of participative
management described by Hinckley (1985), Kanter (1983), and Sashkin (1984). The GES was chosen because this instrument has acceptable reliability and was the best one of those reviewed on several comparisons (see Appendix A).

Fourth, the Myers-Briggs Type Indicator (MBTI) is one of the most widely used indicators of personality type and is a valid and reliable measure of this variable (Myers & McCaulley, 1985). The study of personality preference is difficult and very expensive, yet organizations are increasingly interested in personality type as evidenced by the increased use of personality instruments in business and industry (Moore, 1987).

Definitions

The following terms are essential to understanding this research and are thus defined:

Psychological typologies are those as originally identified in 1923 by Jung (1923/1971). Jung theorized that random variations in behavior caused by certain basic differences in mental functioning are orderly and consistent (Myers, 1962a). For purposes of this study these typologies are operationalized by the four functions of the Myers-Briggs Type Indicator (MBTI):

1. Sensing with thinking (ST).
2. Sensing with feeling (SF).
3. Intuition with feeling (NF).
4. Intuition with thinking (NT).
Participation leadership behaviors are those leadership behaviors through which all participants involved in a work situation or product decision have equal opportunity to provide information and input into the decision (Hinckley, 1985; Kanter, 1983; Likert, 1967; McGregor, 1960; Sashkin, 1982). For purposes of this study these behaviors are operationalized by the three dimensions from the Group Environment Scale (GES, Moos, 1986).

Myers-Briggs Type Indicator (MBTI) was developed by Myers and Briggs in the 1940s (Myers, 1962b) as a method to identify Jungian typology. The test identifies 16 typologies grouped by 4 functions:

1. Sensing with thinking (ST).
2. Sensing with feeling (SF).
3. Intuition with feeling (NF).
4. Intuition with thinking (NT).

The MBTI is a paper and pencil instrument that utilizes multiple choice responses. (See Chapter II, pages 30 and 31.)

Group Environment Scale (GES) is one of nine social climate scales developed by Moos (1974). The scale is composed of 10 subscales that measure the social environmental characteristics or behaviors of task oriented groups (Moos, 1974). These subscales are grouped by three dimensions:

1. The relationship dimension.
2. The personal growth dimension.
3. The system maintenance dimension.

The GES is a paper and pencil instrument that utilizes a true-false response format. (See Chapter II, page 41.)
Personal Data Questionnaire (PDQ) was developed to gather demographic information. This form is located in Appendix B.

Specific Hypotheses

As stated earlier the conceptual hypothesis is that there is a relationship between the personality type functions, as identified by the MBTI, and participation leadership behaviors, as identified by the GES. The general study hypotheses were:

1. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score on the relationship dimension of the GES.

2. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score on the personal growth dimension of the GES.

3. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score on the system maintenance and system change dimension of the GES.

To determine whether there were differences between the four MBTI functions and the GES dimension, chi-square ($x^2$) and analysis of variance (ANOVA) tests were used.

1. STs, SFs, NFs, and NTs were compared to the mean score on the relationship dimension of the GES.
2. STs, SFs, NFs, and NTs were compared to the mean score on the personal growth dimension of the GES.

3. STs, SFs, NFs, and NTs were compared to the mean score on the system maintenance and system change dimension of the GES.

The relationships between MBTI and GES scores were further analyzed using analysis of variance (ANOVA). The specific expectations regarding the hypotheses were:

1. Those individuals classified as sensing with thinking (ST) on the MBTI would have a low score on the relationship dimension of the GES.

2. Those individuals classified as sensing with thinking (ST) on the MBTI would have a low score on the personal growth dimension of the GES.

3. Those individuals classified as sensing with thinking (ST) on the MBTI would have a low score on the system maintenance and system change dimension of the GES.

4. Those individuals classified as sensing with feeling (SF) on the MBTI would have a high score on the relationship dimension of the GES.

5. Those individuals classified as sensing with feeling (SF) on the MBTI would have a high score on the personal growth dimension of the GES.

6. Those individuals classified as sensing with feeling (SF) on the MBTI would have a low score on the system maintenance and system change dimension of the GES.
7. Those individuals classified as intuitive with feeling (NF) on the MBTI would have a high score on the relationship dimension of the GES.

8. Those individuals classified as intuitive with feeling (NF) on the MBTI would have a high score on the personal growth dimension of the GES.

9. Those individuals classified as intuitive with feeling (NF) on the MBTI would have a high score on the system maintenance and system change dimension of the GES.

10. Those individuals classified as intuitive with thinking (NT) on the MBTI would have a low score on the relationship dimension of the GES.

11. Those individuals classified as intuitive with thinking (NT) on the MBTI would have a low score on the personal growth dimension of the GES.

12. Those individuals classified as intuitive with thinking (NT) on the MBTI would have a high score on the system maintenance and system change dimension of the GES.

All expectations regarding the hypotheses are stated in directional terms. A complete discussion of the rationale supporting these linkages is included in Chapter III.

Statement of Procedures

The study was conducted with first-line supervisors from an engine plant of a large automotive corporation. All participants were administered the MBTI, PDQ, and the GES. The total population
was 113 supervisors, of whom 76 participated in all aspects of the study. Results of these instruments were analyzed using the chi-square and analysis of variance (ANOVA) statistics. Each of the three general hypotheses was tested separately, with conclusions and recommendations identified. The directional hypotheses are also reported on in Chapter IV.
CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study is to investigate the relationship between the Myers-Briggs Type Indicator (MBTI) and the participative management behaviors of first-line supervisors as measured by the Group Environment Scale (GES). In this chapter a review of related literature is presented. The chapter is divided into the following: (a) organizational leadership theory, (b) participative decision making, (c) first-line supervisory position, (d) Jungian typology, (e) the Myers-Briggs Type Indicator, and (f) the Group Environment Scale.

Organizational Leadership Theory

Organizational theory is divided into four segments (Owens, 1987). They are: (1) classical organizational leadership theory movement (1910-1935), (2) human relations movement (1935-1950), (3) organizational behavior movement (1950-1975), and (4) human resources management (1975-1987).

Classical Organization Theory

Classical management theorists dominated the early 1900s and proposed theories such as scientific management (Taylor, 1911) of bureaucratic organization (Weber, 1947) and administrative management.
(Fayol, 1929; Urwick, 1940). These theorists favored achieving organization efficiency by dividing tasks into specialized roles, devising explicit work rules, and establishing a hierarchy with many controls that ensured compliance with rules and procedures. The following set of organizing principles demonstrate the general viewpoint of classical theorists (Wexley & Yukl, 1984): (a) labor divided into functional areas, (b) clearly defined jobs, (c) clear chain of command, (d) unity of direction, (e) managers have narrow span of control, and (f) manager has authority to fulfill responsibility.

Classical theories proved to be successful because there was an abundance of workers and the system provided an excellent opportunity for workers to exchange one valued thing for another (Burns, 1978). The strategy was to decrease the discretion of low level jobs while increasing the control of a small number of supervisors (Immerwahr & Yankelovich, 1984).

The Human Relations Movement, 1935-1950

Organization theories relating to the human relations movement began with Hawthorne's (cited in McGregor, 1960) studies done at Westinghouse in the 1920s and 1930s. These studies were formulated in response to the classical theories. The movement stressed real concern for the mental health and welfare of people. The human relations movement encouraged management to involve workers in planning, organizing, and controlling their own work.
Informal work groups within organizations influence the behavior of individuals (Homans, 1950). When the groups identified with the goals of management, productivity increased. When the groups decided that their own goals were in opposition to those of management, productivity remained low or possibly decreased even further (Mayo, 1933). Satisfaction for group members within a work group is not solely the consequence of economic reward and/or physical comfort. Satisfaction is improved by a cohesive and emotionally supportive work group (Mayo, 1933). Groups within an organization are the carriers of values and beliefs, and workers seek to meet their need for affiliation and esteem through these groups. Because people value their memberships in work groups, such groups have a powerful affect upon behavior (Schachter, 1959). Schachter found that people seek affiliation because they wish to have their beliefs confirmed. People with similar beliefs tend to seek each other out. This need for affiliation is especially strong if a value or need has been shattered or denied.

Likert (1967) based his System 1-4 theory upon survey research conducted during the 1950s to discover what causes managers to be effective or ineffective. He concluded that effective and ineffective managers demonstrated marked difference and behavior patterns in leadership, communication, decision making, goal setting, and control. Leaders who used behavior patterns designed to develop cohesive groups with high performance goals were most effective.

Application of the principles of the classical organization theorists lead to a System 1 or 2 organization. Application of the
human relations organizational principles lead to a System 3 or 4 organization. Research showed that the most effective organizations were System 4 (Likert, 1967). Under the concepts of the human relations movement organizations exercise control through the socialization of participants to the values of the organization (Owens, 1987).

The Organizational Behavior Movement, 1950-1975

The field of research was broadened to define and explain the role of the organizational behaviorist as a part of the human relations movement (Owens, 1987). The organizational behavior movement developed because of the work of several prominent theorists who were concerned with the behavior of the total organization. This movement was grounded in the laboratory method developed through sensitivity training and T-groups (Wexley & Yukl, 1984).

Several contributions made by organizational theorists enhanced the understanding of the total organization. C. I. Barnard (1938) illustrated the importance of the leader understanding the relationship between the formal and informal organizational structure. Another work (Roethlisberger & Dickson, 1939) examined the interaction between the formal organizational structure and the informal social structure represented by the relationship between workers. Simon (1947) emphasized the importance of the administrator understanding human behavior in the making of a decision. The emphasis shifted from strictly humanistic theories to a more intense study of the behavioral concepts that influenced work motivation.
Behavioral change within groups is a function of a person's personality related primarily to motivation or needs and the situation or environment surrounding the person (Lewin, 1935). According to Lewin, the environment is a field force that pushes and pulls on the person and the situation. If the needs of the person are known and the situation valence either positive or negative is known, behavior can be predicted. Change, according to Lewin, is much easier to direct at the group level than at an individual level.

All organizations are characterized by their culture, which is a powerful tool in creating effective organizations (Owens, 1987). Efficient organizations provide individuals with incentives to join and maintain membership within a group. Effective organizations link the successful use of participation to the fulfillment of organizational purpose (C. I. Barnard, 1938).

The research on participative leadership and decision making has had an impact on the organizational development within our society. Lewin's (1935) research on change is the building block for change within groups. His ideas on change have had a greater impact on organization development, both direct and indirect, than any other person's (Burke, 1982). Lewin was interested in studying autocratic versus democratic behaviors within groups (Marrow, 1969) and his work led to the use of survey research to study change within groups.

Human Resources Management, 1975-Present

This movement has the middle-range theories of Weick (cited in Owens, 1987) as its base. The movement emerges from a broad range of
research from both business and industry as well as from the education field. While no single explanation has been devised to explain organizational behavior, uncertainty and change have emerged as the fundamental problems facing organizations (Thompson, 1967).

Successful organizations learn to accept change that goes with uncertainty. Thompson (1967) envisioned organizations as having a "technical core" where the actual work of the organization is performed. The technical core of the business is the main product or service provided by the organization. In addition, the work force is interdependent and organized into boundary spanning units whose main goal is to protect and influence the external environment of the technical core.

Organizations that strive to change behavior or attitude of individuals without changing the same behavior in the group may cause the group to impose sanctions upon the individual (Lewin, 1951). This person may be alienated from the group or totally rejected by the group (Homans, 1950; Schachter, 1959).

Participative Decision Making

Participative decision making is a method for making decisions. This method stresses the importance of all participants involved in a work situation or product decision, to have equal ability to provide information and input into that decision (Kanter, 1983). Participative management involves all members of the work group in planning and control of their own activities (Sashkin, 1982). Participation is a process that is interactive, and true participation requires
that individuals join in with others to form a group in pooling their knowledge to reach conclusions (Hinckley, 1985). To achieve the best decisions, both McGregor (1960) and Likert (1967) suggested similar ideas: the principles of supportive relationships, group decision making, and high performance goals. These constructs are all involved with the successful use of participative management.

The use of participation can increase the commitment of the subordinate to achieve goals and to successfully implement group decisions (Lewin, 1948). This approach can also be used to encourage compliance within groups (Homans, 1950; Schachter, 1959). When a person is allowed to participate in determining a goal, he or she is more likely to create his or her own forces toward accomplishing the goal than where the goal is determined and imposed by others. Generally, when goals are imposed upon a person, the one who imposed the goals must exert continuous influence; otherwise other forces not associated with goal accomplished will influence the behavior (Lewin, 1948).

A review of 110 studies from 1969 to 1980 indicated that in 90% of the cases specific challenging goals led to higher performance (Locke et al., 1981). Studies done by Coch and French (1948) and Jewell and Reitz (1981) support the belief that people will accept decisions more readily that they helped to make rather than those imposed upon them. This factor helps to explain the generally positive consequences of participative decision making.
Concerns Regarding Participative Decision Making

The determination of a single best leadership type for a person or situation is not possible. As a rule those organizations that perform routine work may fare better with a classical approach to decision making. Those organizations that must respond to uncertainty and change can effectively use the concepts of participation in the decision-making process (Owens, 1987).

One of the major components of work motivation is distinguishing between the motivation to simply participate in a decision and the motivation to perform effectively in making decisions as a part of a team (C. I. Barnard, 1938; Vroom, 1964). Barnard theorized that productive organizations are cooperative systems that are able to develop a congruence between the organization and the individual. Barnard advocated that individuals develop cooperative, participative skills through education and socialization. These skills are termed empowerment and are knowledge based (Kelley, 1988).

Furthermore, personality differences among people make some fit better than others in groups requiring responsibility and active involvement in groups that participate in decisions (Vroom, 1964). This fact is critical to the hypothesis being tested.

Participative Decision Making Within the Company

A movement towards participative management in the subject company began during the mid 1940s and was initiated by the president and chairman of the company. As far back as the 1920s, he advocated
making decisions through committee. These committees would be comprised of individuals with a vested interest in the decision. Several examples are cited in his autobiography, one being the decision to create a finance committee and another being the establishment of a purchasing committee. Each of these committees would coordinate the policies concerning the decision making for their respective department. The president also established the company's employee research section which initiated research on employee attitudes. This development would later become known as the Quality of Work Life (QWL) movement.

Quality of Work Life Movement Within the Subject Company

The actual QWL movement within the subject company was initiated by the president to change the relationship between the company and all employees. He developed a working relationship with Rensis Likert from the University of Michigan's Institute for Social Research, and Likert was instrumental in the preliminary planning for the QWL movement. The original purpose of the QWL effort was to enhance the work life of all employees and to drive decision making down to the lowest level (Senior Executive, 1989).

In the early 1970s the company officially agreed with the union to the concepts inherent in a more participative culture. The union's and the company's quality of work life program is one of the earliest industrial efforts to change the culture of an organization. As early as the late 1960s, a top official of the union, who was head of the union's department assigned to the subject company, began to
have meetings to prepare workers to become equal partners with the company in the decision-making process.

The ideas generated in the QWL movement led to the concept of jointness within the union and the company. In 1986 this relationship was cemented with the joint opening of the Human Resource Center (HRC). This center jointly administers programs for all union represented company workers.

Since the HRC is a negotiated issue, there are no guaranteed provisions for management participation in programs that are developed at the center. Consequently, union members have had far greater exposure to and training in the theoretical constructs of participative decision making and have developed a knowledge base to shift the balance of power from the supervisor to the worker (Senior Executive, 1989).

The 1973 agreement shifted the emphasis of the QWL movement from all employees, including supervisors, and focused the efforts of the QWL movement on the hourly work force. This decision created uncertainty for all mid-level managers and specifically for first-line supervisors, since they react daily with the hourly work force. While there is a recognition of the needs of the first-line supervisors in relation to using participative management, little has been done to correct the inequity (Senior Executive, 1989).

Group Efforts at Participative Management

During the spring and summer of 1986 the senior staff of one of the car groups met to discuss what participative management means to
the group and how to best practice this concept. The concepts and model chosen were a normative theory (Vroom & Yetton, 1973). Leaders will choose a leadership behavior based upon the followers' ability and willingness to participate in the decision. Leaders will develop a wide range of leader behaviors from autocratic to participative and will choose the best one based upon the situation (Hersey & Blanchard, 1982; Vroom & Yetton, 1973). As a consequence of the meeting the senior staff adopted the following mission statement relating to participative management, quality of work life, and strategic management.

The ... group has recognized that it must manage its business strategically if it is to remain competitive in the long run. A key element in accomplishing this is to develop a participative style of management which strengthens the ... group's ability to reach its goals by tapping the total human resource and, as a result, improves its quality, productivity, and quality of work life.

The above statement is based on a fundamental belief that when people are working toward a clear direction, are involved in the process, and are experiencing success, the goals of both the business and the employee are achieved. This, in turn, encourages a higher quality of participative management.

In essence, the route to effective management is strategy coupled with appropriate involvement of people who create and integrate new ideas into successful business ventures. (Confidential Memo, Subject Company, 1986, un-numbered pages)

First-Line Supervisory Position

The need for first line supervisors developed in response to the classical theorists' need to control the production line (Immerwahr & Yankelovich, 1984). The job of the first-line supervisors at the
subject company was to supervise the people on the line and they developed into the technical experts that kept the line running.

The responsibilities of first-line supervisors in this specific setting were studied by Hennig and Jardim (1978). While they reported that each plant had its own priorities, climate, and style, they identified eight general responsibilities that were common across the many different plants: (1) enough people to start the line going, (2) training the people on the line, (3) making sure the people on the line can do the job, (4) supplying the necessary tools and materials, (5) monitor the quality level, (6) control costs, (7) control grievances, and (8) making sure their section is not responsible for stopping the line.

The job of the first-line supervisor has always been a difficult one. This difficulty is compounded today by the changes that are taking place in the relationship between the hourly worker and the first-line supervisor (Senior Executive, 1989). Prior to the development of the QWL, the first-line supervisors knew their role—closely supervise the line. As the QWL movement expanded, the first-line supervisory role changed. The role became less day-to-day close supervision of the assembly line and moved towards the idea of the supervisor becoming the "linking pin" between higher management and the hourly worker (Likert, 1967).

In 1941 a group of first-line supervisors at a large automotive corporation formed an association called the Foreman's Association of America (FAA). The purpose of the FAA was to improve pay and job security while increasing the status of first-line supervisors.
Prior to 1947 private sector managers, including first-line supervisors, had the right to bargain collectively with their employer. Due to concerns with managers bargaining for themselves, the Taft-Hartley Act of 1947 under the National Labor Relations Act (NLRA, cited in Schlesinger & Klein, 1987) eliminated management's obligation to bargain with managers.

Work in America Institute (1989) noted that while employee involvement programs continue to expand, very few have adequately addressed the role of the supervisors. While supervisors believe that the QWL movement, participation, or employee involvement is good for the company (72%) and good for the employee (60%), less than a third (31%) view participation as beneficial to supervisors (Klein, 1984). Supervisors, in general, were more dissatisfied with participative systems than were employees above or below them (Walton & Schlesinger, 1979).

Supervisors were expected to push their duties down to the work team and disappear (Walton & Schlesinger, 1979). Technology has also threatened the first-line supervisor (Hall, 1986). While many threats exist, the position responsibility continues to exist and thrive even though the title may have changed (Klein, 1985; Schlesinger, 1982). While the position continues to exist, the span of control has changed. From 1940 to 1970 the worker-to-supervisor ratio decreased and beginning in the late 1970s and continuing into the 1980s the trend reversed itself (Edwards, 1979). Companies began to cut workers and managers to remain competitive (Klein, 1985). The decrease in the managerial work force due to competitive factors has
been accelerated by participative programs and by new technologies (Hill & Kerr, 1984; Hill, Kerr, & Broedling, 1986).

Supervisors have been left out of the decision-making process and view participation as a threat (Senior Executive, 1989). Some explanations have surfaced for nonsupport by supervisors of participative systems: (a) Supervisors are told to participate; (b) the problem of upper management being paternalistic; and (c) the question, Is participation voluntary for supervisors? (Kanter, 1983).

Jungian Typology

The type theories of Jung were developed in the 1920s to explain human personality. Jung first published the theory of psychological type in 1921. In 1923, the studies were translated from German into English by Baynes. Jung theorized that random variations in behavior caused by certain basic differences in mental functioning are orderly and consistent (Myers, 1962a). Jung (1923/1971) identified a number of typologies that described a person's basic psychological processes. These processes or differences merge into patterns that determine an individual personality type. Type theory is based upon the theory that all people use four basic mental functions which are represented by the letter S for sensing, N for intuition, T for thinking, and F for feeling. Type theory stands as one of Jung's most important contributions (Brawer & Spiegelman, 1964; McCaulley, 1978; Richek & Brown, 1968). A person has a preference and definite attitude when using each function (Jung, 1923/1971). The individual personality grows from specializing in preferred traits associated
with type. All individuals develop a preference for type. Type is not static but dynamic and allows for continued growth and development throughout life (McCaulley, 1977).

**Attitudes: Extraversion and Introversion**

Jung described two different but complementary attitudes toward the outer world, extraversion and introversion. All humans share these two attitudes and use both, but each person prefers one over the other. Extraverts (E) choose people as a source of energy and need to socialize. Extraverts charge up by being with people. Introverts (I) prefer solitude and receive energy from being alone. Introverts charge their batteries with quiet time. Extraverts (E) are motivated by the outside world and make up about 65% of the population. Introverts (I) focus their perception and judgment upon the inner world of ideas and constitute 35% of the population (Keirsey & Bates, 1984).

**Perceptive Functions: Sensing (S) and Intuition (N)**

Sensing and intuition are the two dichotomous modes of perception. Perception involves all the ways of becoming aware of the environment (Myers & McCaulley, 1985). In the perceptive function sensing (S) is the term used for perceiving the observable with the use of the five senses. In this mode the person is primarily interested in the present, immediate experience. Sensing people are described as realists who tie facts together in a systematic fashion and test each new fact for relevance. Sensing individuals have acute
powers of observation, are orientated toward the present, and have
great memory for details. Intuition (N) is the term used for the
perceiving of possibilities, relationships, and meanings by the use
of insight. Jung (1923/1971) characterized this phenomenon on per-
ception by way of the unconscious, that is, intuition can best be
described as a "hunch" and permits individuals to perceive events or
relationships beyond what is visible to their senses. The intuitive
pursues possibilities and is an imaginative and creative person.
Jung stated "the certainty of intuition rests equally on a definite
state of psychic 'alertness' of whose origin the subject is uncon­
scious" (p. 453).

Judging Functions: Thinking (T) and Feeling (F)

Judgment involves all the ways of coming to conclusions about
what has been perceived (Myers & McCaulley, 1985). Jung (1923/1971)
termed the opposite ways of deciding what to do about what you have
perceived as thinking (T) or feeling (F). When using T logical,
impersonal decisions will be reached based upon cause and effect.
When using F a person uses their values or group values to make deci­
sions.

While the importance of the judgment and perception functions
are clearly stated throughout much of Jung's work, the team of Myers
and Briggs made them explicit. The development of the JP index along
with the EI index clarify which of the two preferred functions is
dominant and which is auxiliary.
Dominant and Auxiliary Functions

The theory of type holds that the four mental processes, S, N, T, and F, are used regularly yet one process becomes better developed. This function becomes the dominant function. The dominant function provides consistency to the personality and the auxiliary provides balance. The idea of a dominant process controlling the other process and shaping the personality was empirically noted by Jung and, along with extraversion-introversion preference, became the basis of his work on psychological types (Myers, 1962a).

Myers (1962a) stressed that the auxiliary function must be different, but not opposed to the dominant function. If the dominant function is a perceptive function then the judgment function must be the auxiliary, or balancing, function. Furthermore, each type uses the dominant function in their preferred attitude. Introverts typically hide their dominant function and show their auxiliary function. Extraverts show their dominant function since they operate in the outer world.

The Myers-Briggs Type Indicator

The purpose of the Myers-Briggs Type Indicator (MBTI) is to measure the personality type and theoretical constructs of Jung (Myers, 1962a). There are four separate indices: extraversion or introversion (EI), sensing or intuition (SN), thinking or feeling (TF), and judging or perception (JP), which under Jungian theory form an individual's personality. The purpose of the MBTI is to determine
the direction and strength that each individual professes on the four indices. The four indices are designed to determine a preferred choice between opposites. Further, the choice on each of the indices is independent of the choice on any of the other three indices. As a consequence, 16 possible types may form from the four indices. The typology is represented by a four-letter code forming the preferences (e.g., ENFJ or ISTP, see Figure 1) and postulates specific relationships among the processes and attitudes. For each type, one process is the dominant and one is the auxiliary. Each person uses this process with a specific attitude, either extraversion (E) or introversion (I). Each preference makes a specific contribution to type (see Table 1).

**History of the Myers-Briggs Type Indicator**

The MBTI is a self-administered, self-reporting paper and pencil instrument developed by Katherine Briggs and her daughter, Isabel Myers. As early as 1915, Briggs began her study of individual differences through the use of biographies. When she read Jung's work and found that his views were similar to her own, yet far more complete, she began an intense investigation of Jungian typology. From 1923 to the start of World War II, Briggs taught the theory to her daughter, Isabel Briggs-Myers. Briggs and Myers continued to study Jung's work and observed the behavior of people in relation to type theory. Many of their early subjects were family members and friends of the family. When the United States entered World War II, Myers increased her efforts to develop an indicator in
### The Location of the 16 Preference Types on the Type Table

<table>
<thead>
<tr>
<th>ISTJ</th>
<th>ISFJ</th>
<th>INFJ</th>
<th>INTJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTP</td>
<td>ISFP</td>
<td>INFP</td>
<td>INTP</td>
</tr>
<tr>
<td>ESTP</td>
<td>ESFP</td>
<td>ENFP</td>
<td>ENTP</td>
</tr>
<tr>
<td>ESTJ</td>
<td>ESFJ</td>
<td>ENFJ</td>
<td>ENTJ</td>
</tr>
</tbody>
</table>

#### Extraversion-Introversion

| E | I |

#### Sensing-Intuition

| S | N |

#### Thinking-Feeling

| T | F | T |

#### Judgment-Perception

| J | P | J |

---

Figure 1. Standard Type Table Format.

Table 1
Contributions Made by Each Preference to Each Type

<table>
<thead>
<tr>
<th></th>
<th>Sensing Types</th>
<th>Intuitive Types</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Thinking</td>
<td>With Feeling</td>
</tr>
<tr>
<td>ISTJ</td>
<td>I: Depth of concentration</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ISFJ</td>
<td>S: Depth of concentration</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>INFJ</td>
<td>I: Depth of concentration</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>INTJ</td>
<td>I: Depth of concentration</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>ISTP</td>
<td>I: Depth of concentration</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ISFP</td>
<td>S: Depth of concentration</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>INFP</td>
<td>I: Depth of concentration</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>INTP</td>
<td>I: Depth of concentration</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>ESTP</td>
<td>E: Breadth of interests</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ESFP</td>
<td>E: Breadth of interests</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ENFP</td>
<td>E: Breadth of interests</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>ENTP</td>
<td>E: Breadth of interests</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>ESTJ</td>
<td>E: Breadth of interests</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ESFJ</td>
<td>S: Breadth of interests</td>
<td>S: Reliance on facts</td>
</tr>
<tr>
<td>ENFJ</td>
<td>E: Breadth of interests</td>
<td>N: Grasp of possibilities</td>
</tr>
<tr>
<td>ENTJ</td>
<td>E: Breadth of interests</td>
<td>N: Grasp of possibilities</td>
</tr>
</tbody>
</table>

anticipation of helping the war effort by carefully matching individuals to jobs. This instrument would become known as the MBTI.

From 1942 until 1962, when Form F was published by Educational Testing Service (ETS), the only purpose of the instrument was research. During the development period, Myers tested each item on larger and larger samples. Acceptance of the instrument was slow, because of the attitude of psychological professionals and the novelty of the instrument's concepts regarding personality testing. Further complicating the acceptance of their ideas was the fact that neither had formal education or training in the field of psychology. From 1962 to 1975 research continued and in 1975 Consulting Psychological Press (CPP) began publishing the MBTI. Also in 1975 the Center for Application of Personality Type (CAPT) was formed to provide MBTI users with educational and research data.

The Combination of Perception and Judgment

While each individual expresses a preference for sensing and intuition, this choice is independent of their choice between thinking and feeling. Both types of judgment are combined separately with each type of perception, and thus four combinations are possible: (1) sensing thinking (ST) types, (2) sensing feeling (SF) types, (3) intuitive thinking (NT) types, and (4) intuitive feeling (NF) types (see Table 2).
Table 2
The Combinations of Perception and Judgment

<table>
<thead>
<tr>
<th></th>
<th>ST</th>
<th>SF</th>
<th>NF</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>People who prefer</td>
<td>Sensing and thinking</td>
<td>Sensing and feeling</td>
<td>Intuition and feeling</td>
<td>Intuition and thinking</td>
</tr>
<tr>
<td>Focus attention on</td>
<td>Facts</td>
<td>Facts</td>
<td>Possibilities</td>
<td>Possibilities</td>
</tr>
<tr>
<td>And handle these with</td>
<td>Impersonal analysis</td>
<td>Personal warmth</td>
<td>Personal warmth</td>
<td>Impersonal analysis</td>
</tr>
<tr>
<td>Thus they tend to become</td>
<td>Practical and matter-of-fact</td>
<td>Sympathetic and friendly</td>
<td>Enthusiastic and insightful</td>
<td>Logical and ingenious</td>
</tr>
<tr>
<td>And find scope for their abilities in</td>
<td>Technical skills with facts and objects</td>
<td>Practical help and services for people</td>
<td>Understanding and communication with people</td>
<td>Theoretical and technical developments</td>
</tr>
</tbody>
</table>

**Sensing Plus Thinking (ST)**

According to Myers (1962a), sensing types with thinking make their decisions based upon their ability to think and decide what they perceive using their five senses. This type prefers factual information and a decision is based solely upon a logical process of cause and effect. STs prefer careers that demand an ability to use impersonal analysis and oftentimes are thought of as cold, impersonal, and "hard hearted." STs are more likely to choose careers that value impersonal analysis, such as police work, supervision, farming, and financial.

**Sensing Plus Feeling (SF)**

According to Myers (1962a), SF persons also rely upon their senses for perception but tend to use feeling to make decisions. These decisions are made with a high degree of consideration for people. SFs tend to be friendly and relate well to people. Generally they choose occupations that have a lot of personal warmth, such as, teaching, social work, health care, and child care.

**Intuition Plus Feeling (NF)**

As reported by Myers (1962a), intuitive types with feeling do not make decisions based upon their senses or facts. They prefer to make decisions based upon possibilities and make these decisions with personal warmth. NFs have great success in communicating with and
understanding people. NFs frequently choose careers in theology, health fields, journalism, and teaching.

**Intuition Plus Thinking (NT)**

According to Myers (1962a), the intuitive with thinking (NT) focuses on the possibilities inherent in a particular situation. Yet due to the thinking function, they tend to make decisions not based upon people and personal warmth, but upon an impersonal analysis of fact. This combination of intuition plus thinking leads to a logical and oftentimes creative or ingenious person. NTs tend to choose careers as research scientist, lawyers, inventors, and managers.

**Extraversion and Introversion (EI)**

Jung's (1923/1971) theory states two fundamental attitudes, extraversion or introversion. This attitude determines how people relate to the outer world. Individuals who prefer extraversion are characterized as action orientated, impulsive towards new events, sociable, communicate easily, and possess an awareness of the environment. Introverts have the following characteristics: thoughtful, contemplative about new ideas, desire clarity of ideas, and appear removed from the outside world. Each person has a definite preference for EI but can relate and use the other function when appropriate. Extraverts choose to work in the outer world of people and in action orientated situations, yet they can work in the world of ideas when necessary. An introvert works best in the world of ideas, yet a well-developed introvert is capable of relating to the world of
extraversion when needed (Myers, 1962a). This decision determines a person's attitude or preference for the EI index.

Validity of the MBTI

The purpose of the MBTI is to measure the constructs of Jungian typology. The MBTI Manual (Myers, 1962a) summarizes the findings from the MBTI and other instruments. One similar instrument, the Gray-Wheelwright or Jungian Type Survey (JTS) was developed by two other Jungian researchers who independently arrived at basically the same conclusion as Myers. While the samples differed in the methods for computing internal consistency scores, there was a high correction for attenuation coefficient between the MBTI and the Gray-Wheelwright (Myers & McCaulley, 1985). The correlation between the MBTI and JTS indicates the instruments measure the same constructs and supports the construct validity of the MBTI. In comparing the JTS to the MBTI the following correlations were identified: .79 EI, .58 SN, and .60 TF. All correlations were significant at the .001 level. The JTS does not have a scale that corresponds to the MBTI JP index. The correlations between the MBTI and the JTS are moderately high and statistically significant (Devito, 1985).

Another method used to validate the MBTI compared a self-assessment by participants to descriptions of the different types as described by Myers. Agreement with the Myers descriptions may be the best measure of the success of the MBTI (Myers & McCaulley, 1985).

Validity of the MBTI is increased by allowing respondents to eliminate items that they cannot express a strong preference for.
Type is more accurately predicted when individuals answer items with certainty (Myers & McCaulley, 1985).

Reliability of the MBTI

The reliability for the MBTI is consistent with other personality tests and the reliability remains stable even when some items are omitted (Myers & McCaulley, 1985). Data on the MBTI's reliability include both internal consistency and the test-retest measure on separate scales and typologies. Using the Spearman Brown prophecy formula, Myers reported split half scores of between .70 and .94 for EI, SN, and JP, and a much lower score of .44 on the TF index. The lower scores on the TF index are attributable to the slow development of the judgment index (Myers, 1962a). The reliability for MBTI type categories using Guttman's Lower Bound Reliability Estimate were in the .40 to .50 range (Stricker & Ross, 1963).

In summarizing retest data with intervals of 7 weeks to 14 months, Devito (1985) reviewed test-retest studies done by Carskadon (1979); Carlyn (1977); Levy, Murphy, and Carlson (1972); and Stricker and Ross (1963). He found reliability coefficients ranging from .48 after 14 months to .87 after 7 weeks. The TF scale remains the least stable (Myers, 1962a). Howes and Carskadon (1979) administered the MBTI and the 16 Personality Factor (16PF) to a group of psychology students. The findings indicated an elevation or lowering of the mood of the students yet the mood changes did not affect test-retest data on the MBTI. In general, the stronger the preference for a MBTI category the greater the chance the participant will
select the type category again.

In a study of 118 psychology students (Carskadon, 1982) concluded that a far greater number of students than expected reported the correct description of type as their number one choice and refuted previous research (Howes & Carskadon, 1979) that a significant number of subjects would change type after an interval.

Two studies of first-line supervisors reviewed and reported by Myers and McCaulley (1985) indicated that supervisors would be primarily STs and SFs (see Table 3). These findings generally support the belief that the great majority of first-line supervisors will not be NFs, which tend to be the naturally democratic leaders that function most easily in a participative environment (Keirsey & Bates, 1984).

| Table 3 |
| First-Line Supervisors' Results in Two Studies |

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Factory and site supervisors (n = 52)</th>
<th>Administrators, managers, and supervisors (n = 3,678)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>48.08</td>
<td>39.40</td>
</tr>
<tr>
<td>SF</td>
<td>36.54</td>
<td>18.57</td>
</tr>
<tr>
<td>NF</td>
<td>7.69</td>
<td>17.54</td>
</tr>
<tr>
<td>NT</td>
<td>7.69</td>
<td>24.50</td>
</tr>
</tbody>
</table>

Concerns for the MBTI

The MBTI has been criticized for a number of reasons. Behavior validation of typological constructs must be encouraged (Carlson & Levy, 1973). Greater effort must be made in replicating validity studies that relate in a logical fashion to the dimensions that the instrument proposes to measure (Devito, 1985). Type preference may be reported incorrectly if the person has difficulty in selecting between their preference and their parents', or the person is undergoing a growth period in MBTI functions that allows different functions to surface (Myers & McCaulley, 1985).

Group Environment Scale

The Group Environment Scale (GES) is one of nine social climate scales. The purpose of the social climate scales, developed by Moos (1974), is to measure the perception of relationships within organizations. Each of the nine instruments measures a different group environment. The nine instruments all investigate three dimensions: the relationship dimension, the personal growth or goal orientation dimension, and the system maintenance and system change dimension (Moos, 1974). (See Table 4 and Figure 2.)

The social climate scales are easily hand scored. Each instrument typically takes 15 to 20 minutes to administer and can be given to a group or an individual. The GES has three forms and each one measures a different aspect of a group setting. The real form (Form R) measures actual group settings, the ideal form (Form I)
Table 4
GES Subscales and Dimension Descriptions

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Relationship dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cohesion</td>
<td>The degree of members' involvement and commitment to the group and the concern and friendship they show for one another.</td>
</tr>
<tr>
<td>2. Leader Support</td>
<td>The degree of help, concern, and friendship shown by the leader for the members.</td>
</tr>
<tr>
<td>3. Expressiveness</td>
<td>The extent to which freedom of action and expression of feelings are encouraged.</td>
</tr>
</tbody>
</table>

Personal growth dimensions

| 4. Independence              | The extent to which the group encourages independent action and expression among members. |
| 5. Task Orientation          | The degree of emphasis on practical, concrete, and "down-to-earth" tasks and on decision making and training. |
| 6. Self-Discovery            | The extent to which the group encourages members' revelations and discussions of personal information. |
| 7. Anger and Aggression      | The degree to which the group tolerates and encourages open expression of negative feelings and inter member disagreement. |

System maintenance and system change dimensions

| 8. Order and Organization    | The degree of formality and structure of the group and the explicitness of group rules and sanctions. |
| 9. Leader Control            | The extent to which the tasks of directing the group, making decisions, and enforcing rules are assigned to the leader. |
| 10. Innovation               | The extent to which the group facilitates diversity and change in its own functions and activities. |

Figure 2. GES Dimensions, Subscales, and Questions for Each Subscale.

measures participants' reaction to perceived ideal group settings, and the expectations form (Form E) evaluates participants' expectations about a new group. Form R was used since this group was an actual task oriented group.

The instrument has 90 true or false items (T&F) that are scored on 10 dimensions which form three subscales. Form R items are printed in booklets that are reusable with a separate answer sheet. Table 4, taken from the GES Manual, describes the 10 subscales.

Validity of the Group Environment Scale

The GES was developed with items from previously developed social climate scales. Other items were developed from structured interviews and from observations of both members and leaders in groups. Each item selected for inclusion had to relate to one of the three dimensions as defined in Table 4. The original form (Form A) was administered to people in 30 groups. These groups came from a variety of settings to ensure that the GES could be applied to more than one type of group. Items selected correlated more highly with their own subscale. The subscales had low to moderate intercorrelations and each item (and each subscale) discriminated among group settings (Moos, 1986). In the final draft 90 items met these conditions.

Normative data had been gathered on members from 148 groups and with 112 leaders. There were 56 task orientated groups, 57 social recreational groups, and 35 psychotherapy and mutual support groups. There was very little difference between the perceptions of members.
and leaders (Moos, 1986). In general, the difference among the three types of groups was consistent with expectations about the nature of groups and contributes to the construct validity of the GES Form R (Moos, 1986).

While Moos (1986) pointed to the construct validity of the GES, the adequacy of the data on validation for the instrument is limited. Greater confidence in the validity of the scale would be enhanced by relating GES scores to members' and leaders' behavior using some form of observation or ethnographic system (Illback, 1985).

Reliability of the Group Environment Scale

Data provided using Cronbach's alphas indicate that the internal consistency of the GES to be reliable. Scores ranged from .65 to .87 specifically on each scale. In a similar study the scores ranged from .62 to .86 on all 10 subscales (Moos, 1986). Test-retest correlations using scores from a 1 month to a 24 month interval range from .65 to .87 (Nezu, 1989). Another study (Illback, 1985) using coefficient alpha with a sample of 246 determined subscale values ranging from .62 to .86 with the average in the mid .70s. The subscales with a sample size of 63 and using test-retest method have a reliability coefficient after a 1 month interval of from .65 to .87 (Illback, 1985). Profile stability studies showed coefficients of .92 at 4 months, .91 at 8 months, .84 at 12 months, and .78 at 24 months (Brill, 1979; Duncan & Brill, 1977; Menard, cited in Moos, 1986).
Group Environment Scale Concerns

In addition to the concerns regarding the lack of research findings to support the validity of the GES, several other factors indicate using caution when interpreting the results of the GES. The lack of sampling information describing the groups used, the concern for aggregating all groups studied into one category to draw conclusions, and the lack of information on the reading level of the GES suggest using restraint in applying the results (Nezu, 1989). While other instruments were reviewed, the GES was selected due to the acceptable reliability and the fact that no other instrument, similar in nature, had any better validity.

The GES is firmly grounded in theory and research. Yet given the lack of validity data and the constraints on the ability to generalize the findings, caution is urged.

Using the GES to Measure Participative Leader Behaviors

Participative leader behavior is a very complex issue. The best method to study participative leader behaviors would be through some form of direct observation of leader behavior over a long period of time. This form of ethnographic observation, while providing the best validity and reliability, was not possible. Leader behavior as well as member behavior within groups has a definite impact upon the people within the work group (C. I. Barnard, 1938; Lewin, 1935; Moos, 1973). Several instruments were investigated (see Appendix A) that measured the behavior of members within
groups. The GES was selected because this instrument had the best reliability, the cost was acceptable, and it had been used previously with task oriented group leaders such as supervisors.

A review of the literature and the accepted operational definition of participative management identify three constructs associated with participative leader behaviors and participative management (Hinckley, 1985; Kanter, 1983; Sashkin, 1982). The constructs accepted as the operational definition of participative management are: membership in the work group, group autonomy in making decisions, and group goal setting. These constructs are supported by the following definitions.

There is the assumption that in general the three dimensions of the GES relate to the respective concept of participative leader behavior, membership in the work group, group autonomy in decision making, and goal setting by the group. There is no statistical certainty that each of the questions asked within the three dimensions of the GES relate to the respective concept of leader behavior. It is logical though given the nature of the questions asked that in general they do measure what they purport to measure.

Participative management involves all members of the work group in planning and control of their own activities (Sashkin, 1982). Participation is the involvement of individuals with a work team that has joint responsibility for setting goals, such as a product, which might be a plan, a decision, a solution to a problem in the work area, or possibly the output of the work area itself (Kanter, 1983). Participation is a process that is interactive and true
participation requires that individuals join in with others to form a group in pooling their knowledge to reach conclusions (Hinckley, 1985).

The GES is comprised of 10 subscales. Each subscale is made up of nine true (T) or false (F) responses. The 10 subscales join together to form three dimensions with Subscales 1-3 forming the relationship dimension; Subscales 4-7 forming the personal growth dimension, and Subscales 8-10 forming the system maintenance and system change dimension. The GES measures the social-environmental characteristics of task-oriented groups. Form R of the GES which was used in this study measures people's actual perception of a member or a leader's behavior in a group setting (Moos, 1986). The instrument is administered to members and leaders within groups and asks members and leaders to evaluate behavior of a target group to which they belong.

Items in each subscale were determined through inter item correlation such that items within a subscale have higher correlation among themselves than with items in other subscales (Moos, 1974). Scores on the subscales can range from 0 to 9.

In this study an assumption was made that the GES dimensions were an accurate operational definition of participative leader behavior. The operational definition (Hinckley, 1985; Kanter, 1983; Sashkin, 1982) identifies three general concepts of participative groups: (1) membership in the work group, (2) group autonomy in decision making, and (3) group goal setting. The 10 subscales are combined into three dimensions and each dimension and each item had
to identify an aspect of a group setting that related to:

1. **Interpersonal relationship or relationship dimension**, that is, such as cohesion of the work group which represents the construct membership in the work group.

2. **Personal growth dimension**, that is, independence or autonomy in making decisions which represents the construct of group autonomy in making decisions.

3. **System maintenance and system change dimension**, that is, leader control or who sets the goals for the group which represents the construct of goal setting for the group.

**Relationship Dimension**

The construct, membership in the work group, is related to the relationship dimension of the GES. This dimension consists of three subscales, each of which consists of nine items which get at the type of relations and behaviors that group members have with one another. This construct, membership in the work group (Hinckley, 1985; Kanter, 1983; Likert, 1967; Sashkin, 1982) is rooted in the work done at Western Electric's Hawthorne plant (Roethlisberger & Dickson, 1939). The research determined that improvements in performance were a result of the participation of all workers from the group in making decisions that affected their work area. As a consequence of this effort the workers in the group formed a strong, cohesive work team (Katz & Kahn, 1966). Also, research has indicated that workers want to have membership in and belong to their work group and these informal work group influences the behavior of
individuals either positively or negatively (Homans, 1950). For instance, are the group members' relationships characterized by cohesion and unity (Question 1), belongingness (Question 21), friendliness (Questions 31 and 42), and openness and trust between group members (Questions 3 and 63) or by the opposite types of behavior? This dimension, which is comprised of the subscales cohesion, leader support, and expressiveness describes the way group members, including the leader, get along and is assumed to be considered a measure of the construct membership in the work group as defined by Hinckley (1985), Kanter (1983), and Sashkin (1982). See Table 4 and Figure 2 for a complete description of the subscales that comprise the relationship dimension.

Personal Growth Dimension

The construct of autonomy in group decision making is related to the personal growth dimension of the GES. This dimension consists of four subscales, each of which is made up of nine items. The four subscales associated with the personal growth dimension are independence, task orientation, self-discovery, and anger and aggression. The relevance of the construct of group autonomy (Hinckley, 1985; Kanter, 1983; Likert, 1967; Sashkin, 1982) in decision making is grounded in the research done on group change (Lewin, 1935). Lewin found that change is much easier to direct at the group level than with individuals, and he used survey research to study autocratic versus democratic behaviors within groups. For team members of work groups that depend upon each other in
performing their daily activities the group method of decision making makes the most sense (Roethlisberger & Dickson, 1939; Sashkin, 1982). In a wide variety of work arrangements, participation in the making of decisions by the group has positive benefits (C. I. Barnard, 1938; Lewin, 1967; Lowin, 1968). For instance, are members of the work team encouraged to be a part of the decision-making process (Questions 9 and 14), the group makes decisions (Question 35), members are expected to take leadership in the group question (Question 44), members need the group's approval of the decision before carrying out the decision (Question 64), and the group helps a member learn new skills (Question 85)? For a complete description of the four subscales see Table 4 and Figure 2.

System Change Dimension

The construct of goal setting is related to system change dimension of the GES. This dimension consists of three subscales and each scale has nine items. The three subscales associated with the system change dimension are order and organization, leader control, and innovation. The importance of the construct group participation in goal setting is grounded in research done on change (Lewin, 1948). In research done in both laboratory and organizational settings, participation in goal setting has proven to generate greater acceptance of the goal and better performance in achieving the goal (Coch & French, 1948; Latham & Yukl, 1975; Locke et al., 1981). As an example, are the activities of the group carefully planned (Question 8), and does the leader tell members what to do or do the
members participate in setting the group's goals (Question 19)? For a complete description of the three subscales, see Table 4 and Figure 2. Table 5 demonstrates the use of the GES to measure participative management.
## Table 5
Using the GES to Measure Participative Management

<table>
<thead>
<tr>
<th>GES subscale</th>
<th>GES dimension</th>
<th>Construct of participative management</th>
<th>Authors supporting the construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expressiveness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td>Personal growth dimension</td>
<td>Autonomy, or the extent to which the group is encouraged to be self-sufficient and make its own decisions about how to do its work</td>
<td>Barnard, 1938; Kanter, 1983; Lewin, 1935; Likert, 1967; Lowin, 1968; Moos, 1974, 1986, 1990; Roethlisberger &amp; Dickson, 1939; Sashkin, 1982</td>
</tr>
<tr>
<td>Task orientation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-discovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger and aggression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order and organization</td>
<td>System maintenance and system change dimension</td>
<td>Goal setting by group--the extent the group is allowed to set its own goals</td>
<td>Coch &amp; French, 1948; Latham &amp; Yukl, 1975; Likert, 1967; Locke, Shaw, Saari, &amp; Latham, 1981</td>
</tr>
</tbody>
</table>
The purpose of this study was to investigate the relationship between the Myers-Briggs Type Indicator (MBTI, Myers & McCaulley, 1985) scores and the leadership behavior of first-line supervisors in a large industrial corporation. One hundred and thirteen supervisors were contacted and asked to volunteer, of whom 76 completed all aspects of the survey. The supervisors' MBTI type functions were compared to their scores on the three dimensions of the Group Environmental Scale (GES, Moos, 1974). Within the chapter the following areas are reviewed: the study design, the research instruments, the general research procedures, the subject population, the method used to gather the data, and the procedures used to interpret the data.

Research Instruments

The three instruments used for data collection were the Group Environment Scale (GES) Form R, the Myers-Briggs Type Indicator (MBTI) Form G, and a Personal Data Questionnaire (PDQ). The MBTI and the GES are routinely used in similar settings and neither instrument is categorized as a high risk instrument. Both instruments are classified by Consulting Psychologists Press (CPP) under the code of ethics as Level B instruments. They are not included in the
appendices but are available from CPP. CPP would not give permission
to include the MBTI and the GES in the appendices. The PDQ was de-
veloped for the population being studied and is included in Appendix
B. While the GES and MBTI are reviewed more thoroughly in Chapter
II, technical data are presented in this chapter.

Both the GES and the MBTI are easy to administer and can be
given in a group setting or individually. While the instruments can
be self-administered, the instruments are ideally suited for use in a
group setting. To minimize differences in the test situation, a
group setting was used in this study.

The MBTI has no time limit and instructions are provided on the
cover. Reading the directions and test implementation generally took
20 to 30 minutes. The instruments were hand-scored by the researcher
within one day of the testing day. If the participant had no prefer-
ence, an item was left blank. If too many items are left blank the
test score is not a reliable measure of personality type (Myers &
McCaulley, 1985). The results were returned and feedback given to
the supervisors within 2 weeks of the test date.

The GES has no time limit, and instructions are provided on the
cover. Test taking and the reading of the directions took between 20
and 30 minutes. The GES was hand scored by the researcher within one
day of the testing day. On this instrument all questions are an-
swered true or false and each question must be answered even if the
participant must guess at the answer (Moos, 1986).

The GES reports 10 subscales organized into three domains that
measure characteristics of task oriented groups. The three domains
are the relationship dimension, the personal growth or goal orientation dimension, and the system maintenance and system change dimension (see Table 4 and Figure 2). GES scores are determined by counting the responses in each column and entering as a raw score. These scores are converted to a standard score using the scoring booklet. The test results were returned and feedback given to the supervisors within 2 weeks of the test date.

General Research Procedures

The study relied upon data from a potential list of 113 supervisors. All first-line supervisors of hourly employees were asked to volunteer. Each supervisor was asked to fill out the MBTI, the GES, and a Personal Data Questionnaire.

Before the study could proceed, the organization needed to give its approval. The facility's production manager agreed to a meeting to discuss the project. During the meeting the following topics were covered: the amount of time each supervisor would be away from his or her job, the possible benefits to the site and to the supervisor, and the fact that supervisors would agree to voluntarily participate. After consultation with the rest of the upper management team, permission was granted to proceed. Before the actual study was completed, a pilot study was done.

Pilot Study

Each of five superintendents was asked to select three volunteers to participate in a pilot study. In the pilot study, 14 of the
15 first-line supervisors were administered the MBTI Form G, the GES Form R, and the PDQ. After the researcher explained the research study and reiterated the volunteer status of the participants, the PDQ was administered to the supervisors. The explanation and administration of the PDQ took 15 minutes; test instructions and implementation of the MBTI took 90 minutes. After a 10-minute break all participants were given the GES. This took less than 30 minutes to administer.

The instruments were hand scored by the researcher. The pilot study was done to help formulate the correct procedures for completing the data gathering and to anticipate problems that the participants might express.

**Sampling Subjects**

The population of subjects in the study were non-UAW members who were all first-line supervisors of hourly employees employed in a single engine plant of a large worldwide industrial corporation located in the Midwest. The supervisors were identified by using the salaried personnel list as of January 1, 1990. Due to the small number of supervisors available (113), each person was asked to participate. Sixty-seven percent completed the study.

All 113 supervisors were contacted through the plant mail and asked to voluntarily participate. If the supervisor agreed to participate and did not make the scheduled testing session, a follow-up call was made to rearrange a testing session. A total sample of 76 supervisors comprised the final study sample.
Individual names of the subjects were not identified and no information was given to their supervisors. The identity of the company, the plant, and the supervisors remain anonymous.

Data Collection Procedures

Three different data collection procedures were considered in relation to administering the MBTI and the GES to the participants (see Figure 3). Under Method A, the MBTI or GES was administered first in all testing sessions. With Method B, the GES and MBTI were rotated with the GES being given first to Groups 1, 3, 5, 7, and 9 and the MBTI being given first to Groups 2, 4, 6, 8, and 10. Under Method C the instruments would be rotated as they were in Method B, but there would be a 2-week break between the administering of the MBTI and GES. Method B was selected for the following reasons: This method was superior to Method A since Method B controlled better for the phenomenon known as response set, which may affect items in the last half of a test or series of tests differently than the items in the first half of the procedure (Isaac & Michael, 1985). Method B was chosen over Method C because of the difficulty in scheduling the groups away from their workplace for more than one day and the length of time in between testing sessions could cause a poor return rate.

In the final analysis, there were 10 groups of 5-18 participants. Each supervisor was notified by plant mail that several testing sessions would be available during their shift and they had been scheduled to attend at a specific time and place. If they could not attend at the scheduled time, they were to select a back-up time.


Figure 3. Data Gathering Chart.

during their regular work hours and attend that session. Each group was read the same statement about the purpose and methodology of the study (see Appendix B).

The testing room was quiet, well lit, comfortable, and removed from interruptions. The testing administrator gave each group an overview of the entire project. As a part of the explanation the participants were reminded that they were volunteering to participate. After supervisors agreed to participate, they filled out the PDQ and the consent form. When this task was completed, the testing administrator read the directions for the GES or MBTI carefully out loud, while participants followed in their manual. Groups 1, 3, and 5 took the GES first and the MBTI second. Groups 2, 4, and 6

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method A</td>
<td>GES</td>
<td>GES</td>
<td>GES</td>
<td>GES</td>
<td>GES</td>
<td>GES</td>
</tr>
<tr>
<td></td>
<td>MBTI</td>
<td>MBTI</td>
<td>MBTI</td>
<td>MBTI</td>
<td>MBTI</td>
<td>MBTI</td>
</tr>
<tr>
<td>Method B</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
<td>MBTI</td>
</tr>
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<td></td>
<td>MBTI</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
</tr>
<tr>
<td>Method C</td>
<td>(2 week break between)</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
<td>MBTI</td>
<td>GES</td>
</tr>
</tbody>
</table>
reversed the process. This method was employed to control for response set. After the first instrument was completed, a 10-minute break was given. When the break was finished, the directions for the other instrument were read aloud and the participants followed the directions in the booklet. All questions were answered and the second instrument was administered.

Groups were small enough so that the test administrator could move about the room assisting with the testing when necessary. While taking the GES, clarification was given regarding word meaning (Moos, 1974), but with the MBTI only word pronunciations were permitted. The testing administrator may not interpret words (Hartzler & Myers, 1984).

For confidentiality, each participant in the study was assigned a number. All of the material filled out by the participants, the PDQ, the GES, the MBTI, and the consent form, were placed in a folder with that number on it. After each testing session, the materials were hand scored using scoring grids provided by Consulting Psychologists Press (CPP). The scoring of instruments by the researcher was completed within 24 hours of test completion. The testing situation was closely monitored by the researcher and all instruments were completed. Two supervisors showed up for testing but did not fill out any forms. They were not counted in the data collection. No instruments were voided. At the conclusion of the data gathering, all scores were transferred onto a master sheet.
Data Interpretation

The MBTI forces a participant into choosing between dichotomous opposites. This creates a nominal discrete dichotomy, which is a variable indicating the presence or absence of a characteristic (Hinkle, Wiersma, & Jurs, 1979). The MBTI functions ST, SF, NT, and NF, or independent variables, were compared to the dependent variables, the three subscales of the GES. The MBTI scores are not expressed with a standard score and are not representative of a normal population sample. MBTI data were reported as either possessing a function or not having that function.

The raw scores on the 10 GES dimensions can be converted to a standard score and assess three domains. In order to compare GES dimensions to MBTI functions a decision was made to accept the fact that a participant either had or did not have a subscale characteristic. This decision was determined by the participant's score in relation to the normative mean score on that particular subscale. A score above the mean indicates the participant had a high amount of that characteristic, while a score at the mean or below the mean indicates a low amount of that characteristic.

The GES subscales indicate characteristics of an ordinal nature and the MBTI scores are reported as a nominal discrete dichotomy. Using the perceptive and the judgment function from the MBTI as the independent variable, each supervisor had a two letter typology compared to the three dimensions of the GES. The GES measures three underlying dimensions in all groups: (1) the relationship dimension,
(2) the personal growth or goal orientation dimension, and (3) the system maintenance and system change dimension.

The four possible typologies from the perceptive and judgment functions of the MBTI and the three underlying dimension scores of the GES were placed in a matrix (see Figure 4) creating 12 cells which were used to report correlation coefficients between MBTI subscales ST, SF, NF, NT, and the GES relationship dimension, personal growth, and the system maintenance and system change dimension. The data were analyzed using chi square and a one-way analysis of variance (ANOVA) with a 3 x 4 format (see Figure 4). A two-way analysis of variance was done to compare demographic variables to MBTI type and GES dimensions.

GES subscale scores

<table>
<thead>
<tr>
<th>Relationship dimension</th>
<th>Personal growth dimension</th>
<th>System maintenance and system change dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>4-7</td>
<td>8-10</td>
</tr>
</tbody>
</table>

Figure 4. Format for Chi Square and One-Way Analysis of Variance of MBTI Functions and GES Dimensions.
Development of Hypotheses

No research studies were located that had investigated the relationship between MBTI type and GES dimensions. However, there are either theoretical perspectives or research findings that permit the development of directional hypotheses. The 12 hypotheses related to this group of supervisors are stated in directional terms based upon the fact that the Group Environment Scale (GES) was developed to measure the behavior of individuals within groups (Moos, 1974). In addition, the MBTI was developed to determine Jungian personality type (Myers & McCaulley, 1985). The expectation was that between 39% and 48% of supervisors would be STs, between 18% and 36% would be SFs, between 8% and 18% would be NFs, and between 8% and 24% would be NTs. For a complete description of these data, see Table 3. After MBTI type was determined, a respondent's mean score on the GES was compared to his or her MBTI type score from the columns.

Sensing With Thinking (ST)

In general, STs use their five senses for purposes of perception and thinking for making judgments about what they perceive. Type theory indicates that they are matter of fact, practical, and impersonal when making decisions (Myers & McCaulley, 1985). For a description of the STs' traits see Table 2.
Hypothesis 1

STs value impersonal analysis of facts and show little concern for individuals when making decisions (Myers & McCaulley, 1985). A respondent scoring high on the relationship dimension would be expected to value a harmonious relationship within the group (Moos, 1986). Given these theorized characteristics, an ST will score low on the relationship dimension.

Hypothesis 2

STs focus on facts rather than on sharing personal information (Myers & McCaulley, 1985). A respondent scoring high on the personal growth dimension would value independent action, group decision making, and open discussion of members' feelings (Moos, 1986). Given these theorized characteristics, an ST will score low on the personal growth dimension.

Hypothesis 3

The STs value a logical, established method for solving problems and do not value innovation or change within the work group (Myers, 1980). A person scoring high on the system change dimension would be expected to tolerate much diversity and change in the group's activities (Moos, 1986). Given these theorized characteristics, an ST will score low on the system change dimension. For a complete description of the subscales of this dimension see Table 4.
In general an SF relies upon sensing for purposes of perception but uses feeling for purposes of judgment. Type theory suggests that SFs are subjective and display warmth and sympathy for people when making decisions. SFs tend to be friendly and are more interested in facts regarding people than facts associated with machines or things (Myers & McCaulley, 1985). For a description of the SF traits see Table 2.

**Hypothesis 4**

SFs display warmth and sympathy for people when making decisions. The SF values harmonious and cohesive relationships and is concerned about how decisions will affect others in the group (Myers & McCaulley, 1985). A person scoring high on the relationship dimension values involvement and cohesiveness within the group (Moos, 1974). Given these theorized characteristics, an SF will score high on the relationship dimension.

**Hypothesis 5**

An SF values personal warmth and provides practical help and service for the group (Myers & McCaulley, 1985). A person scoring high on the personal growth dimension values autonomy in allowing the group to make decisions (Moos, 1974). Given these theorized characteristics, an SF will have a high score on the personal growth dimension.
Hypothesis 6

SFs use facts and value the use of their five senses when making decisions. They want precise information (Myers & Myers, 1980). A person scoring high on the system change dimension will be able to tolerate diversity and change in the setting of goals within the group (Moos, 1986). Given these theorized characteristics, an SF will score low on the system change dimension.

Intuition With Feeling (NF)

In general, NFs prefer to use their intuition (N) over their sensing for the purpose of perception. These individuals use their feelings to make decisions about what they have seen. NFs are usually interested in developing communication within the group and are enthusiastic and warm individuals (Myers & McCaulley, 1985). They are generally considered excellent leaders in group settings (Keirsey & Bates, 1984). For a description of NF traits see Table 2.

Hypothesis 7

NFs value a strong cohesive and harmonious relationship between the leader and the group members, and they encourage all members to express their viewpoint (Keirsey & Bates, 1984). A person who scores high on the relationship dimension values cohesive and supportive relationships between group members (Moos, 1974). Given these theorized characteristics, an NF will have a high score on the relationship dimension.

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**Hypothesis 8**

The NF leader encourages independent action by members to contribute their knowledge and personal information, and allows for disagreement among members (Keirsey & Bates, 1984). The NF, especially the ENFJ, is considered the naturally democratic leader. A person who scores high on the personal growth dimension values allowing the group members to be self-sufficient and autonomous in making group decisions (Moos, 1974). Given these theorized characteristics, an NF will have a high score on the personal growth dimension.

**Hypothesis 9**

An NF's best chance for success involves the unfolding of possibilities, especially in setting goals for people. NFs are normally comfortable with change (Myers & McCaulley, 1985). A person who scores high on the system change dimension values the ability to change (Moos, 1974). This dimension of the GES is characterized by change within the group and NFs are normally comfortable with change because they are regularly seeking possibilities in new situations. An NF is concerned about the complexities of communication and is enthusiastic and insightful about group change (Myers & McCaulley, 1985). Given these theorized characteristics, an NF will score high on the system change dimension.

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Intuition With Thinking (NT)

In general, NTs focus on possibilities and find the best use of their abilities in theoretical and technical types of developments (Myers & McCaulley, 1985). NTs use their intuition (N) to perceive what is occurring and their thinking (T) to decide what they will do about what they have perceived.

Hypothesis 10

NTs value an impersonal attitude in analyzing the facts and relate well to theoretical and technical developments. NTs do not place a high value on the feelings of group members when making decisions (Myers & McCaulley, 1985). A person who scores high on the relationship dimension values cohesive and harmonious relations among group members (Moos, 1974). Given these theorized characteristics, an NT will have a low score on the relationship dimension.

Hypothesis 11

NTs value practical, concrete facts and impersonal analysis of the facts (Myers & McCaulley, 1985). A person who scores high on the personal growth dimension values allowing the group to be self-sufficient or autonomous in decision making (Moos, 1974). Given these theorized characteristics, an NT will have a low score on the personal growth dimension.
Hypothesis 12

NTs value logical processes and are normally skilled at seeing the possibilities in a given situation. They do well when there is a clear set of rules for the group to follow (Myers & Myers, 1980). A person who scores high on the system change dimension values the ability to change with some degree of formal group rules and sanctions (Moos, 1986). Given these theorized characteristics, the NT will have a high score on the system change dimension.
CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The purpose of this study was to investigate the relationship between Jungian typology as determined by the functions on the Myers-Briggs Type Indicator (MBTI, Myers & McCaulley, 1985) and the participative management behaviors of a population of first-line supervisors as determined by the Group Environment Scale (GES, Moos, 1974). This chapter includes information and data relating the study findings to the hypotheses. Following are the general study hypotheses tested:

1. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score on the relationship dimension of the GES.

2. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score on the personal growth dimension of the GES.

3. There is a difference between the MBTI functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the mean score of the system maintenance and system change dimension of the GES.
There were also some expectations regarding the direction each hypothesis would follow.

This chapter is divided into an introduction, a description of the population and instruments, presentation of the data, findings for each hypothesis, and a summary.

Description of the Population and Instruments

Seventy-six first-line supervisors from an engine plant of a large worldwide automotive corporation were tested in groups ranging in size from 5 to 18 respondents. Leadership behavior was determined by analysis of scores on the three dimensions of the GES. There are 10 subscales of the GES, which are organized into three dimensions, a relationship dimension, a personal growth dimension, and a system maintenance dimension. Participants in the study were considered high or low on each dimension depending on whether the score on that dimension was higher or lower than the mean for that dimension.

Supervisors were defined as persons who directly supervise an hourly person. The total population as of January 1, 1990, was 126. Before the data were collected, 13 supervisors were transferred to other plants or were no longer supervising hourly employees. Two supervisors refused to fill out any part of the survey and 35 were unable to attend due to work pressures or vacation. An effort was made to reschedule anyone who missed the scheduled time.

All respondents completed a Personal Data Questionnaire (PDQ), which provided some specific demographic data used for analysis. A copy of the PDQ is in Appendix B. The data in Table 6 describe more
fully the characteristics of this sample. Ninety-seven percent of those surveyed were males and 89% were white. The average age was 47 years and the average educational level of a supervisor was roughly a sophomore in college. The average length of company service was 25.7 years, and nearly all respondents (98%) had some prior experience as an hourly employee.

Table 6
Analysis of Demographic Data From the MBTI, GES, and PDQ

<table>
<thead>
<tr>
<th></th>
<th>Number/(\times)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>74</td>
<td>97%</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Length of company service</td>
<td></td>
<td>Ave. 25.7 yrs.</td>
</tr>
<tr>
<td>Length of service as supervisor</td>
<td></td>
<td>Ave. 14.5 yrs.</td>
</tr>
<tr>
<td>Length of service as supervisor in department</td>
<td></td>
<td>Ave. 7.8 yrs.</td>
</tr>
<tr>
<td>Race: Black</td>
<td>6</td>
<td>8%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>White</td>
<td>68</td>
<td>89%</td>
</tr>
<tr>
<td>Highest grade completed</td>
<td></td>
<td>Ave. 13.5 yrs. of school</td>
</tr>
<tr>
<td>Age</td>
<td>47 yrs.</td>
<td></td>
</tr>
</tbody>
</table>

The MBTI classifies respondents using a four letter code which depicts one of 16 types. Each classification is determined by a forced choice dichotomy. The sample, \(n = 76\), had a far greater
number of introverts (I) than was expected (see Table 7). In the
general population a normal expectation is that 25% of the population
will be introverts (Myers, 1962a). In studies of supervisors re-
viewed by Myers and McCaulley (1985), introverts comprised 46% of the
population _n_ = 52 and 44% of the population _n_ = 3,678. Fifty-six
percent of the supervisors in this study were introverts (see Table
7).

The number of sensing (S) and intuitive (N) individuals was con-
sistent with a prior study of supervisors, _n_ = 52, and somewhat high-
er than a sample of administrators, managers, and supervisors _n_ =
3,678. The number of sensing individuals in the study was 6% higher
than estimates for sensing types in the general population.

The population studied was 97% males and 60% of the males in the
general population are expected to be thinking (T) types, while 65% of
the females in the general population are expected to be feeling
(F) types (Myers & McCaulley, 1985). Seventy-eight percent of the
sample were thinking types.

In the population studied 75% were judging (J) types, which is
somewhat higher than the two groups of supervisors reported by Myers
and McCaulley (1985). (See Table 7.) In the general population
about 55% of the respondents will be judging types (Myers &
McCaulley, 1985). In the two groups, _n_ = 52, 67% were J and 33% were
P, while the group of supervisors, _n_ = 3,678, 68% were J and 32% were
P.

Information about MBTI types is most frequently presented in a
format called a "type table." Type tables, specifically the
<table>
<thead>
<tr>
<th>Function</th>
<th>Sample (n = 76)^a</th>
<th>Percentage in general population estimate^b</th>
<th>First-line supervisors (n = 52)^c</th>
<th>Administrators, managers, and first-line supervisors (n = 3,678)^d</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>34 44</td>
<td>75</td>
<td>28 54</td>
<td>2,060 56</td>
</tr>
<tr>
<td>I</td>
<td>42 56</td>
<td>25</td>
<td>24 46</td>
<td>1,618 44</td>
</tr>
<tr>
<td>S</td>
<td>62 81</td>
<td>75</td>
<td>44 85</td>
<td>2,133 58</td>
</tr>
<tr>
<td>N</td>
<td>14 19</td>
<td>25</td>
<td>8 15</td>
<td>1,545 42</td>
</tr>
<tr>
<td>T</td>
<td>60 78</td>
<td></td>
<td>27 56</td>
<td>2,354 64</td>
</tr>
<tr>
<td>Males</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>16 22</td>
<td></td>
<td>25 46</td>
<td>1,324 36</td>
</tr>
<tr>
<td>Males</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>57 75</td>
<td>55</td>
<td>35 67</td>
<td>2,501 68</td>
</tr>
<tr>
<td>P</td>
<td>19 25</td>
<td>45</td>
<td>17 33</td>
<td>1,177 32</td>
</tr>
</tbody>
</table>

^aPopulation sample this study (n = 76). ^bEstimates from general population (Myers, 1962a). ^cFirst-line supervisors reported by Myers and McCaulley, 1985 (n = 52). ^dAdministrators, managers, and supervisors reported by Myers and McCaulley, 1985 (n = 3,678).
normative tables, provide base data for comparison against other populations (Macdaid, McCaulley, & Kainz, 1986). (See Appendix E.)

Presentation of Data

The data were analyzed using a number of statistics including chi square, a one-way analysis of variance (ANOVA), and a two-way analysis of variance.

Several analyses of variance were done to determine if such variables as age, experience, or educational level had any relationship to participants' MBTI scores and whether these demographic variables were related to the three GES dimensions (see Table 6). No significant findings were detected.

The function scores on the MBTI were determined by administering the MBTI Form G. In this study scores were determined by hand scoring the instruments, using stencils provided by Consulting Psychologists Press (CPP). The mean score on the relationship dimension of the GES Form R was determined from the sum of the cohesion, leader support, and expressiveness subscales of the instrument. The mean score on the personal growth dimension was determined from the sum of the independence, task orientation, self-discovery, and anger and aggression subscales. The mean score on the system maintenance dimension was determined from the sum of the order and organization, leader control, and innovation subscales.

Based upon normative data from the GES, those respondents at or below the mean were low on that dimension. If the score was above the mean, they were considered high on that dimension. The decision
to use the mean score on the GES was made due to the small population size \((n = 76)\). If the group was normally distributed, about 50% of each MBTI type would be high and 50% would be low on any GES dimension. This technique was employed in hopes of detecting statistically significant differences between GES mean dimension scores of the supervisors and the normative data available on the instrument.

Findings

The numbers of each MBTI type with high or low scores on the three GES dimensions are reported in Tables 8, 9, and 10. There were only two NFs in the population sampled, and they do not appear in the table nor are they included in the statistical tests. Using chi square, the relationship between MBTI personality type and GES dimension scores is reported. None of the differences was statistically significant (see Tables 8, 9, and 10).

The same data for MBTI types and GES dimension scores were analyzed using analysis of variance (ANOVA). Again, no significant findings were discovered. See Tables 11, 12, and 13 for ANOVA results.

The expectation for Hypothesis 1 was that an ST would be low on the relationship dimension. There were 48 STs and only 17 were low on this dimension and their mean score was not in the expected direction. The chi-square value for the hypothesis was 2.13 (2 degrees of freedom) and was not significant \((p = .46)\). Also see Tables 11, 12, and 13 for ANOVA results which indicate similar findings.
Table 8
Number of Supervisors Categorized ST, SF, NF, and NT Scoring High or Low on the Relationship Dimension

<table>
<thead>
<tr>
<th>Frequency of MBTI function type</th>
<th>ST</th>
<th>SF</th>
<th>NF</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship dimension score category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>17</td>
<td>8</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>High</td>
<td>31</td>
<td>6</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

Note. $x^2$(relationship dimension) = 2.13, df = 2, p = .3447 NS. NFs ($n = 2$) not computed for ANOVA or chi square ($x^2$).

Table 9
Number of Supervisors Categorized ST, SF, NF, and NT Scoring High or Low on the Personal Growth Dimension

<table>
<thead>
<tr>
<th>Frequency of MBTI function type</th>
<th>ST</th>
<th>SF</th>
<th>NF</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal growth dimension score category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>24</td>
<td>10</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>High</td>
<td>24</td>
<td>4</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Note. $x^2$(personal growth dimension) = 1.60, df = 2, p = .46, NS. NFs ($n = 2$) not computed for ANOVA or chi square ($x^2$).

The expectation for Hypothesis 2 was that an ST would be low on the personal growth dimension. There were 48 STs and 24 were low and 24 were high. The mean score was not in the expected direction. The chi-square value for the hypothesis was 1.60 (2 degrees of freedom)
Table 10
Number of Supervisors Categorized ST, SF, NF, and NT
Scoring High or Low on the System Maintenance
and System Change Dimension

<table>
<thead>
<tr>
<th>Frequency of MBTI function type</th>
<th>ST</th>
<th>SF</th>
<th>NF</th>
<th>NT</th>
</tr>
</thead>
<tbody>
<tr>
<td>System maintenance dimension score category</td>
<td>Low</td>
<td>29</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>High</td>
<td>19</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

Note. $\chi^2$(System maintenance and system change dimension) = 2.8, $df = 2$, $p = .25$, NS. NFs ($n = 2$) not computed for ANOVA or chi square ($\chi^2$).

Table 11
Comparison of MBTI Functions ST, SF, NF, and NT and GES Relationship Dimension Using ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F ratio</th>
<th>F prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>8.9103</td>
<td>2.9701</td>
<td>0.9976</td>
<td>.3990</td>
</tr>
<tr>
<td>Within groups</td>
<td>72</td>
<td>214.3704</td>
<td>2.9774</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>223.2807</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

and was not significant ($p = .46$). See Table 12 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 3 was that an ST would have a low score on the system maintenance and system change dimension. There were 29 STs low on this dimension and 19 STs high on this dimension.
Table 12
Comparison of MBTI Functions ST, SF, NF, and NT and GES Personal Growth Dimension Using ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F ratio</th>
<th>F prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>1.7224</td>
<td>0.5741</td>
<td>0.4528</td>
<td>.7161</td>
</tr>
<tr>
<td>Within groups</td>
<td>72</td>
<td>91.2999</td>
<td>1.2681</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>93.0222</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Even though the relationship was in the expected direction, the relationship was not significant. The chi-square value for this hypothesis was 2.8 (2 degrees of freedom) and was not significant ($p = .25$). Also, see Table 13 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 4 was that an SF would have a high score on the relationship dimension. There were 14 SFs, of whom 8 were low and 6 were high. The relationship was not in the expected...
direction. The chi-square value for the hypothesis was 2.13 (2 degrees of freedom) and was not significant (p = .46). See Table 11 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 5 was that an SF would have a high score on the personal growth dimension. Only 4 out of 14 were high on this dimension and the scores were not in the expected direction. The value of chi square for the hypothesis was 1.60 (2 degrees of freedom) and was not significant (p = .46). See Table 13 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 6 was that an SF would have a low score on the system maintenance dimension. The 14 respondents did not report scores in the expected direction, 7 were high and 7 were low. The chi-square value for the hypothesis was 2.8 (2 degrees of freedom) and was not significant (p = .25). See Table 12 for ANOVA results which indicate similar findings.

The results of Hypotheses 7, 8, and 9 are not reported due to the small number (n = 2) that reported the NF type. A recommendation is made in Chapter V regarding this concern.

The expectation for Hypothesis 10 was that an NT would score low on the relationship dimension. Of the 12 NT respondents, 5 reported low scores. The results were not in the expected direction. The chi-square value for the hypothesis was 2.13 (2 degrees of freedom) and was not significant (p = .34). See Table 11 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 11 was that an NT would have a low score on the personal growth dimension. Of the 12 respondents, 6
were low and 6 were high. The results were not in the expected direction. The chi-square value for the hypothesis was 1.60 (2 degrees of freedom) and was not significant ($p = .46$). See Table 13 for ANOVA results which indicate similar findings.

The expectation for Hypothesis 12 was that an NT would have a high score on system maintenance dimension. Of the 12 respondents, 7 were high and in the expected direction. The chi-square value for the hypothesis was 2.8 (2 degrees of freedom) and was not significant ($p = .25$). See Table 12 for ANOVA results which indicate similar findings.

**Summary**

All study hypotheses were rejected. There was not a statistically significant difference between the four MBTI personality type functions and the dimensions of the GES. The conclusions from the data analysis and recommendations are presented in Chapter V.
CHAPTER V

DISCUSSION AND RECOMMENDATION

This study was conducted to determine the relationship between Jung's psychological type as determined by the functions of the Myers-Briggs Type Indicator (MBTI, Myers & McCaulley, 1985) and the leadership behaviors of a group of supervisors. The Group Environment Scale (GES, Moos, 1974) was used as a measure of leader behaviors in the work group. The primary objective of the study was to determine the personality type that would be most able to use and to encourage others to use participative leader behaviors. A secondary objective was to use this information to help supervisors better understand the changes by developing a training program to learn the necessary participative behaviors and to have the company use the information in selecting and developing more effective teams. These secondary objectives would help both the supervisor and the company better understand the changes that were occurring. This chapter contains a discussion regarding the findings and recommendations.

There were no significant relationships between MBTI personality functions sensing with thinking (ST), sensing with feeling (SF), intuition with feeling (NF), and intuition with thinking (NT) and the three dimensions of the GES at the .01 level. The hypotheses were rejected. Personality type determined by the MBTI functions did
not have any significant relationship to leadership behavior determined by the GES dimension.

Discussion

Overall there is no support for any of the hypotheses. There are several explanations or interpretations of the findings. It is possible that due to measurement error the tests did not measure the intended characteristics and behaviors. Given the cautions taken in selecting the instruments and conducting the data gathering, this explanation is unlikely. Several other reasons may have contributed to the findings.

1. No one has attempted to determine the relationship of MBTI personality functions and the three dimensions of the GES as a measure of participative leader behaviors. This study was an effort to do so. The MBTI has been widely used as a means for improving communications, teamwork, and leadership (McCaulley, 1981) and the GES measures the characteristics of task oriented groups such as a work group or team with a first-line supervisor (Moos, 1986). While there is nothing wrong with the instruments, there is the possibility that these two instruments do not relate to each other in any meaningful way.

2. During the data collection, some intervening factors may have influenced the participants' responses, especially on the GES. A number of significant events took place at the time of the study. These included: (a) the transfer of a very popular plant manager, (b) a great many supervisors left the company due to a reduction in
personnel, (c) the transfer of many first-line supervisors to other facilities, (d) the closing of several other plants on the site, (e) extensive overtime demands on the remaining supervisors, and (f) an announcement was made that the plant being studied was scheduled to close in 1992.

In this study there was a real possibility that the type of leadership behavior employed by the first-line supervisor was determined more by their need to survive the environmental factors rather than by expressing their true preference in making decisions. This factor may have had a far greater influence on the results than could be controlled for in the tests or by the testing procedure.

3. While correct testing procedures were followed when administering the instruments, the results may be flawed. All participants in the study were volunteers and the possibility exists that volunteers are different from nonvolunteers (Isaac & Michael, 1985). Another problem was the small sample (n = 76). In general, the larger the sample the smaller the sampling error (Isaac & Michael, 1985).

4. The fourth factor which may have influenced the results are the tests themselves. While the MBTI has accepted validity and reliability, no psychological instrument can always accurately predict personality type (Myers, 1962b). There are factors which may affect the results on the MBTI; they are: (a) measurement error, (b) stages of type development of the supervisors taking the tests, and (c) environmental factor that interferes with the person expressing true preferences (Myers & McCaulley, 1985).
There is the possibility that measurement error played some part in the fact that no relationship was found between MBTI functions and GES dimensions. The population sampled, however, was fairly representative of other groups of supervisors who have taken the GES and the MBTI with the exception that there was a far greater number of introverts (I) than was expected from a review of the number if introverts in the general population and other groups of supervisors (Myers & McCaulley, 1985).

Type development is a dynamic concept, not static. Given the age and educational level of the work force, it is reasonable to assume that this group is representative of normal type development.

Of real concern in this study were the environmental factors which changed dramatically in the late 1980s. Several plants located on the site were closed, many supervisors left the company or were outplaced to other facilities within the company, and extensive overtime for the remaining supervisors was common.

The remaining supervisors who responded were a homogeneous group in many respects. The great majority had worked on the line (98%), they were predominantly white males (89%), with 26 years of seniority, and more than half were STs (63%). The respondents in all likelihood were excellent at supervising a small area but were uncomfortable accepting the many changes and challenges that participative leadership brought.

There was a distinct possibility that the environmental factors had a marked influence on the results. There is no information available on the impact these factors had on the GES, but it must be
assumed that these factors influenced the responses in a negative fashion since the purpose of the instrument is to measure the social and environmental conditions of groups (Moos, 1986). These supervisors were under tremendous pressure and stress to survive the environment.

5. The fifth factor which may have influenced the results was the low number of NFs. The NF personality type was reported in only 2 of the 76 cases. In general, assembly line work in plants, including supervisory work, demands ST type behaviors. Yet there was the expectation that enough of each of the four types would be identified for statistical analysis. The low number of NFs did not allow for any statistical comparison between NFs and the other three personality types in relation to their scores on the three GES dimensions. In reviewing literature for this study, there was an expectation that the sample of 113 supervisors would generate from 10 to 22 supervisors in the NF category. Not only were the NFs low in absolute terms but to other groups that were logically assumed to be similar. This expectation was based upon studies reviewed by Myers and McCaulley (1985) (see Table 1). The lack of NFs generates several possible explanations:

1. During the early 1980s, many younger supervisors, both male and female, were recruited from the military and colleges. They were hired through company sponsored assessment centers; and when business conditions worsened in the late 1980s, they were the first to leave. Many took the buy-out, some returned to school or to the military, and many were outplaced. There is the possibility that some of these
supervisors were NFs. There were well over 100 supervisors who left.

2. NFs are not rewarded by the system and quickly leave to seek other types of work in the organization.

3. The system does not allow NFs in because the work demands ST type behavior. This could indicate that the management system in the plant studied has not changed to become more participative, yet this conclusion is very speculative and not supported by statistical data.

Conclusions

The environment in which the research was conducted was extremely uncertain. All the subjects were confronting job loss, an uncertain economic situation, and an almost certain closing of the plant. Although each person voluntarily agreed to participate in the research, the environment may have prevented them from reporting their true preferences for personality type; and in particular, the environment could have prevented them from accurately assessing and reporting their own leadership behaviors. The supervisors may have reported preferences for the MBTI and GES which seemed "safe" to them. In some instances one alternative is more acceptable socially within the group than is another alternative, and this is referred to as the social desirability response set (Isaac & Michael, 1985).

There are very limited data about the interaction between the MBTI and the GES. Both of these instruments have been found to be reliable measures of behavior but were possibly not robust enough to overcome the environment.
From the 3 general study hypotheses, 12 directional hypotheses were developed. These hypotheses were developed in order to predict from a theoretical and assumptive basis the expected results when comparing an ST to an SF to an NF to an NT on the relationship dimension, personal growth dimension, and system maintenance and system change dimension of the GES. The curious fact is that data from 10 of the 12 directional hypotheses suggest a trend away from the direction predicted. At this point there is no statistical evidence of any relationship between the MBTI functions and the GES dimensions.

Recommendations

This study determined that there were no significant statistical relationships between the four MBTI types and the three dimensions of the GES. One of the purposes of this research was to generate greater awareness and understanding of the role of psychological type and the supervisors' ability to perform their job using a more participative approach. In spite of preparing a careful research design based upon a clear strategy, sound logic, and conducting the field work in a responsible manner, the hypotheses were not supported. There are several lessons to be learned.

Future Research

Researchers must pay careful attention to the environment to insure that participants can objectively respond to the questions on each of the instruments. From the time the study was conceived to
the data collection phase, many environmental factors had worsened and the following recommendations should be considered for future research.

1. There is a need for more research on the relationship between the MBTI and the GES. The MBTI has acceptable reliability and validity and this instrument has a vast body of statistical data to support its use as a measure of Jungian personality type. The GES has had acceptable reliability, yet there is no certainty that the GES is a valid indicator of participative leadership behaviors. A simple procedure to measure the construct validity of the GES would be to compare it with other tests that purport to measure participative leadership. Greater confidence in the validity of the GES is a necessity.

2. There is a need to develop an instrument that helps to identify the behaviors needed by participative managers. Very little information has been made available on the study of leader behaviors. Some form of ethnographic observation would be helpful in identifying appropriate behaviors or constructs. Possibly a good start would be to better identify the major constructs of participative leaders' behaviors and then to do observations of leaders who are perceived as participative.

3. There is a need to continue to study the theory of leadership, especially the relationship of leaders and followers in determining what makes for a successful participative decision-making team (Burns, 1985). This statement suggests that leadership is a structure of action that engages both leaders and followers to varying
degrees of activity in order to solve problems. Is participation in
decision making by the whole team (leader and followers) the best way
to get the desired results?

4. In order to test the conceptual hypotheses of a relationship
between personality type and leadership behavior, an additional study
is recommended. With so few NFs, no statistical comparisons were
possible. There was an assumption that NFs would be the most partic­
ipative leaders, especially ENFJs (Keirsey & Bates, 1984). Another
study could duplicate this study but with a larger number of supervi­
sors. After type had been determined, an equal number of supervisors
(30-40) who prefer sensing with thinking (ST), sensing with feeling
(SF), intuition with feeling (NF), or intuition with thinking (NT)
would be randomly selected and given the GES. This method would
allow for a full statistical comparison between personality on the
MBTI function types and leadership behavior as determined by GES
dimension.

5. If a replication study is to be undertaken, some considera­
tion should be given to using the same instruments in an industry
that is less troubled. This study could be done in the computer
industry, in a plant setting other than automotive, or in the service
industry such as in a hospital setting.
APPENDICES

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Appendix A

Comparison of Instruments Measuring Personality Type and Organizational and Interpersonal Congruence
<table>
<thead>
<tr>
<th>COMPARISON OF PERSONALITY INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TITLE</strong></td>
</tr>
<tr>
<td>I.B. MYERS/K.C. BRIGGS</td>
</tr>
<tr>
<td>J. SINGER/M. LOOMIS</td>
</tr>
<tr>
<td>A.L. EDWARDS</td>
</tr>
<tr>
<td>STARKE/HATHAWAY/MCKINLEY</td>
</tr>
<tr>
<td><strong>AUTHOR(S)</strong></td>
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N/A = Not Available

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SOURCES OF RELIABILITIES NEXT PAGE
## Comparison of Instruments Measuring Organizational and Interpersonal Congruence

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NOTE: MODERATE DEGREE OF SUBSCALE INTERCORRELATION ON GES BETWEEN "EXPRESSIVENESS" SUBSCALE .51 TO "INNOVATION." AUTHORS CLAIM THESE ACCOUNT FOR 10% OF THE SUBSCALE VARIANCE.
Sources of Reliability Data


Appendix B

Letters to Participants, Consent Forms, Personal Data Questionnaire, Script of Group Meetings, Outline of Group Meetings, and Follow-up Correspondence
Date: December 18, 1989

Subject: STUDY OF FIRST LINE SUPERVISORS

To: All Superintendents

Per our conversation of 12/13/89, I am confirming a meeting on 1/3/90 at 7:30 a.m. in the Manufacturing Conference Room. Each of you is to select three first line supervisors to participate in the pilot study. The meeting is expected to last between 2 and 1/2 and 3 hours.

Would you please give a copy of this memo to each supervisor you select. There is no preparation needed on their part and they do not need to bring anything. If you have any questions, please contact the Personnel Office at 7-0573.

Jim Conlen
May 15, 1990

Dear Supervisor:

I am writing to ask for your voluntary participation in my dissertation research. As many of you know, I am studying first line supervisors personality type and their management behaviors. I will be using the Myers-Briggs Type Indicator to determine type and the Group Environment Scale to assess management behaviors in a work group. I am contacting all first line supervisors of hourly employees in your plant to complete the MBTI, the GES and a short informational survey. This data will be kept in strict confidence with no individual results being identified. If you wish, I will personally provide feedback on the instruments to you.

The MBTI is a proven measure that indicates a preferred type for an individual. There are not "good" or "bad" types. All types are valuable and make a unique contribution to a work group. The MBTI is one of the most widely used instruments of its kind and can provide information regarding training needs, teamwork and communication within organizations. The purpose of the GES is to measure the climate of a work group and has been in use since the 1970's.

You have been scheduled to attend an informational and data collection meeting on ______. At the meeting you will be given an explanation of the project, of the instruments and how the information will be used. The meeting will take place in the Plant 9 Training Area (Conference Room 1) on the mezzanine.

I look forward to your assistance with my data collection. All participants will meet in groups of 25-30 people. Each instrument will be thoroughly explained and you will have an opportunity to ask questions when the explanation is completed. A follow-up session will be scheduled for anyone who wishes more information about personality type.

Sincerely,

James J. Conlen
Graduate Student
Western Michigan University
Home Phone (313) 625-7445
Work Phone (313) 377-6567
*PLEASE COMPLETE BEFORE TAKING THE MYER-BRIGGS TYPE INDICATOR (MBTI) AND THE GROUP ENVIRONMENT SCALE (GES)*

**CONSENT TO PARTICIPATE IN MBTI & GES RESEARCH**

If you have decided to voluntarily participate in the MBTI and GES research please indicate your preference for results by placing an "X" by the appropriate option below:

OPTION 1__________ I wish to participate purely on a research basis and do not desire feedback on my individual results. I understand that a copy of the final report will be made available for review.

OPTION 2__________ I would like to obtain feedback on my individual results. I also understand that the researcher will contact me to arrange a mutually convenient time and place to review results and provide interpretation. A trained colleague may be asked to assist when necessary.

If you have selected the first option please complete all data on the answer sheets but exclude your name to retain anonymity.

If you have selected the second option please fill in your name on both answer sheet and complete the information that follows on this form:

I (print name) ___________________________ request feedback on my individual scores and I also understand that this data will be kept strictly confidential.

(signature) _____________________________ (date) ________________

(phone) _____________________________

If you have any questions please contact me on (313) 625-7445 or (313) 377-6567. Thank you for your assistance.

James J. Conlen
PARTICIPANT SURVEY

PERSONAL DATA QUESTIONNAIRE

INSTRUCTIONS: Place an (x) next to the item that best describes your response to each question. In order to correctly score the MTBI it is necessary to know the participant's sex. (Previous studies indicate that men and women respond differently on parts of the MTBI).

Your Name _____________________ Superintendent _____________________
Dept. # ______________________

Length of company service _______ as of Jan. 1, 1990. Please indicate in years.

Length of company service as a first-line supervisor ______. Please indicate in years.

Male _____________________ Female _____________________

Racial background: (Check one only)
- Black____
- Hispanic____
- American Indian____
- White____
- Asian____
- Other____

Are you a member of any Foreman's or Manager's Association? Yes ____ No ____

Only group results will be published. Individuals will not be identified. If you wish to have feedback on the results from the MTBI and the GES make sure that you place your name on the score sheets. I will be happy to meet you to discuss your results. The meeting will be confidential and only you will know your individual scores.

If you have any questions, please contact me at work (313) 377-6567. Thank you for your cooperation regarding the above.

James Conlen
Script of Group Meeting

INTRODUCE MYSELF—
NAME
2 min.
Model Introduction  CURRENT POSITION
For Participants  LENGTH OF COMPANY SERVICE
HOBBIES

WELCOME and thank you for attendance
3-5 min.
—bathrooms, and refreshments
—Read Following statement: This statement will be read to all
groups so that each group will have the same knowledge of the
study.

I know that you have been encouraged by your immediate
supervisor to attend this session today and I want to thank you
for your presence. I want you to know that your participation in
the data gathering for my research project on First line
supervisor is critical to the success of the project and is
totally voluntary.

If you choose not to participate, do not fill out any of the
forms, no one will be given that information. If you fill out the
forms and the instruments and later decide not to participate
simply call me at (313) 377-6567 and tell me to delete your data
by the number from my data bank. If you have any questions,
please don’t hesitate to call me.

As many of you know, I am studying first line supervisors
personality type and their management behaviors. I will be using
the Myers-Briggs Type Indicator to determine type and the Group
Environment Scale to assess management behaviors in a work
group. I am contacting all first line supervisors of hourly
employees in your plant to complete the MBTI, the GES and a short
informational survey. This data will be kept in strict confidence
with no individual results being identified. If you wish, I will
personally provide feedback on the instruments to you.

The MBTI is a proven measure that indicates a preferred type
for an individual. There are no “good” or “bad” types. All types
are valuable and make a unique contribution to a work group. The
MBTI is one of the most widely used instruments of its kind and
can provide information regarding training needs, teamwork and
communication within organizations. The purpose of the GES is to
measure the climate of a work group and has been in use since the
1970's.
I look forward to your assistance with my data collection. All participants will meet in groups of 25-30 people. Each instrument will be thoroughly explained and you will have an opportunity to ask questions when the explanation is completed. A follow-up session will be scheduled for anyone who wishes more information about personality type.

ANSWER ANY QUESTIONS 3-5 min.

INTRODUCTION OF PARTICIPANTS
NAME:
DEPARTMENT:
LENGTH OF COMPANY SERVICE:
HOBBIES SPECIAL INTEREST:

EXPLANATION OF PROJECT
-3 instrument, MBTI, GES, PDQ
-Consent Form MBTI, GES 5 min

DESCRIPTION OF MBTI
-answer questions, fill out answer sheet 40 min

BREAK 10 MINS

DESCRIPTION OF GES
-answer questions fill out answer 40 min

*Group I, III, and V will take the MBTI first.
*Group II and IV will take the GES first

COMMENTS AND QUESTION
ARRANGE FOLLOW-UP SESSION

THANKS
JAMES CONLEN
July 5, 1990

TO: All Survey Participants

FROM: Jim Conlen

RE: Follow-up Session on MBTI & GES

I want to personally thank you for taking time from your busy schedule to participate in my data collection. I have met with 76 supervisors who participated fully in my survey and I want to schedule a time to meet with all of you to discuss your results.

The follow-up session will take about 1 1/2 hours and I will schedule enough sessions to make it convenient for each one of you to attend. I encourage you to attend one of the following sessions:

- (Days) Wed - 7-11-90 8:30 Plant 9 mezz Conf Room
- (Days) Wed - 7-11-90 10:30 Plant 55 Conference Room
- (Days) Wed - 7-11-90 12:30 Plant 18 Conference Room

- (After) Thurs 7-12-90 3:30 Plant 55 Conference Room
- (After) Thurs 7-12-90 5:00 Plant 55 Conference Room
- (After) Thurs 7-12-90 7:00 Plant 18 Conference Room

If you are unable to attend one of these sessions, please contact me at (313) 377-6567 and I will make arrangements to meet with you at another time.

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Appendix C

Confirmation Letter From Human Subjects Institutional Review Board and Permission Letters From Consulting Psychologist Press
Date: February 12, 1990

To: James Joseph Conlen

From: Mary Anne Bunda, Chair

This letter will serve as confirmation that your research protocol, "Relationship of Myers Briggs Functions and First Line Supervisory Behavior", has been approved under the exempt category of review by the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

Cc: E. Kelley, Educational Leadership

HSIRB Project Number 89-11-14

Approval Termination February 12, 1991

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In response to your request of February 6, 1991, permission is hereby granted to you to include Figure 4-1 (page 31), Table 4-1 (page 32), and Table 4-3 (page 35) from the Manual for the MBTI in your dissertation entitled "The Psychological Typologies and Leadership Behaviors of First-Time Supervisors in a Large Automotive Company." These tables and figure may remain in your dissertation for microfilming and individual copies may be supplied upon demand. This permission reflects the title change of your dissertation. Permission is granted for this project only.

for [ ] research ONLY  [ ] commercial use  [ ] clinical use

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(d) Payment of a reproduction fee of $ [ ] fee waived

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CONSULTING PSYCHOLOGISTS PRESS, INC.

By ________________________ Permissions Department

Date 7 February 1991
In response to your request of February 6, 1991, permission is hereby granted to you to include the Group Environment Scale subscale and dimension descriptions (from pg. 2) from the GES manual in your dissertation entitled "The Psychological Typologies and Leadership Behaviors of First-Time Supervisors in a Large Automotive Company." These descriptions may remain in your dissertation for microfilming and individual copies may be distributed upon demand. This permission reflects the title change of your dissertation. Permission is granted for this project only.

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(d) Payment of a reproduction fee of $$____ fee waived$$

(e) James Conlen agrees(s) to assign all right, title, and interest in translations, versions, and/or modifications of this instrument to CPP or as directed by CPP.

By Jill Perry
Permissions Department

CONSULTING PSYCHOLOGISTS PRESS, INC.

Date 7 February 1991

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Appendix D

The Location of the 16 Preferences and Contributions
Made by Each Preference to Each Type

109
## The Location of the 16 Preference Types on the Type Table

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### Extraversion-Introversion
- **E** (Extraversion)
- **I** (Introversion)

### Sensing-Intuition
- **S** (Sensing)
- **N** (Intuition)

### Thinking-Feeling
- **T** (Thinking)
- **F** (Feeling)

### Judgment-Perception
- **J** (Judgment)
- **P** (Perception)
## Contributions Made by Each Preference to Each Type

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**Sensing Types**
- **ISTJ**
  - I: Depth of concentration
  - S: Reliance on facts
  - T: Logic and analysis
  - J: Organization
- **ISFJ**
  - I: Depth of concentration
  - S: Reliance on facts
  - F: Warmth and sympathy
  - J: Organization
- **INFJ**
  - I: Depth of concentration
  - N: Grasp of possibilities
  - F: Warmth and sympathy
  - J: Organization
- **INTJ**
  - I: Depth of concentration
  - N: Grasp of possibilities
  - T: Logic and analysis
  - J: Organization

**Intuitive Types**
- **ISTP**
  - I: Depth of concentration
  - S: Reliance on facts
  - T: Logic and analysis
  - P: Adaptability
- **ISFP**
  - I: Depth of concentration
  - S: Reliance on facts
  - F: Warmth and sympathy
  - P: Adaptability
- **INFP**
  - I: Depth of concentration
  - N: Grasp of possibilities
  - F: Warmth and sympathy
  - P: Adaptability
- **INTP**
  - I: Depth of concentration
  - N: Grasp of possibilities
  - T: Logic and analysis
  - P: Adaptability

**Judging Types**
- **ESTP**
  - E: Breadth of interests
  - S: Reliance on facts
  - T: Logic and analysis
  - P: Adaptability
- **ESFP**
  - E: Breadth of interests
  - S: Reliance on facts
  - F: Warmth and sympathy
  - P: Adaptability
- **ENFP**
  - E: Breadth of interests
  - N: Grasp of possibilities
  - F: Warmth and sympathy
  - P: Adaptability
- **ENTP**
  - E: Breadth of interests
  - N: Grasp of possibilities
  - T: Logic and analysis
  - P: Adaptability

---

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Appendix E

MBTI Type Tables for Population and Comparison to Similar Groups
Source of data:  

Group tabulated:
1st Line Supervisors
GES

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.
I = Self-selection index: Ratio of percent of type in group to % in sample.

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Note concerning symbols following the selection ratios:
* implies significance at the .05 level, i.e., Chi-square > 3.8;
# implies significance at the .01 level, i.e., Chi-square > 6.6;
* * * implies significance at the .001 level, i.e., Chi-square > 10.8.
(underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
Public Managers
Base total N = 523. Sample and base are independent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *

Type table order

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### Source of data

Group tabulated:

1st Line Supervisors
GES

(none)

### MBTI Type Table

Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.  
I = Self-selection index: Ratio of percent of type in group to % in sample.

<table>
<thead>
<tr>
<th>SENSING types with THINKING</th>
<th>INTUITIVE types with FEELING</th>
<th>N</th>
<th>%</th>
<th>I</th>
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<tbody>
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<td>ISTJ *</td>
<td>ISFJ</td>
<td>23</td>
<td>30.26</td>
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</tr>
<tr>
<td>N= 5</td>
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<td>13</td>
<td>55.26</td>
<td>1.25</td>
</tr>
<tr>
<td>% 6.58</td>
<td>% 6.58</td>
<td>1</td>
<td>0.00</td>
<td>0.49</td>
</tr>
<tr>
<td>I  2.16</td>
<td>I  2.35</td>
<td>5</td>
<td>0.80</td>
<td>1.41</td>
</tr>
</tbody>
</table>

| ISTP                      | ISFP                          | 5  | 6.58 | 0.53 |
| N= 5                      | N= 5                          | 12| 15.79 | 1.11 |
| % 6.58                    | % 6.58                        | 1  | 0.00  | 0.32 |
| I  2.16                   | I  2.35                       | 3  | 0.80  | 1.25 |

| ESTP                      | ESTJ                          | 3  | 3.95 | 0.86 |
| N= 3                      | N= 2                          | 12| 15.79 | 0.64 |
| % 3.95                    | % 2.63                        | 1  | 0.00  | 0.27 |
| I  1.34                   | I  0.86                       | 5  | 0.80  | 1.34 |

| ESTP                      | ENFP                          | 2  | 22.37 | 1.56 |
| N= 3                      | N= 2                          | 12| 15.79 | 0.64 |
| % 3.95                    | % 2.63                        | 1  | 0.00  | 0.27 |
| I  1.34                   | I  0.86                       | 5  | 0.80  | 1.34 |

Note concerning symbols following the selection ratios:

* implies significance at the .05 level, i.e., Chi-square > 3.8;  
# implies significance at the .01 level, i.e., Chi-square > 6.6;  
* * * implies significance at the .001 level, i.e., Chi-square > 10.8.

(underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
Administrators, Managers and Supervisors
Base total N = 3678. Sample and base are independent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *

<table>
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<td>0.0108</td>
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<td>0.0667</td>
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<td>0.2662</td>
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Source of data: Group tabulated: 1st Line Supervisors GES

(none)

N = 76

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<tr>
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<td>I = 0.63</td>
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<td>% = 6.58</td>
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<td>% = 1.32</td>
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<td>I = 0.20</td>
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<tr>
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<td>% = 3.95</td>
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<td>% = 1.32</td>
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<tr>
<td>I = 0.69</td>
<td>I = 0.69</td>
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<td>N= 0</td>
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<td>% = 10.53</td>
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<tr>
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Note concerning symbols following the selection ratios:
* implies significance at the .05 level, i.e., Chi-square > 3.8;
# implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_(underscore)_ indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
Police Supervisors
Base total N = 105. Sample and base are independent.

** * * * Calculated values of Chi-square or Fisher's exact probability ** * * *

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### Source of data

Group tabulated:

1st Line Supervisors

GES

(none)

### MBTI Type Table

Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type. I = Self-selection index. Ratio of percent of type in group to % in sample.

<p>| | | | | | |</p>
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Note concerning symbols following the selection ratios:

* implies significance at the .05 level, i.e., Chi-square > 3.8;
# implies significance at the .01 level, i.e., Chi-square > 6.6;
* (underscore) indicates Fisher's exact probability used instead of Chi-square.

Base population used in calculating selection ratios:
Factory and Site Supervisors
Base total N = 52. Sample and base are independent.

* * * * * Calculated values of Chi-square or Fisher's exact probability * * * * *

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Note concerning symbols following the selection ratios:
- * implies significance at the .05 level, i.e., Chi-square > 3.8;
- # implies significance at the .01 level, i.e., Chi-square > 6.6;
- * (underscore) indicates Fisher's exact probability used instead of Chi-square.

Base population used in calculating selection ratios:
Security Managers
Base total N = 91. Sample and base are independent.

**Calculated values of Chi-square or Fisher's exact probability**

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BIBLIOGRAPHY


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