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An Investigation Into the Benefits Associated With Self-Directed Work Teams

Brian J. Moffatt
University of Northern Iowa

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Abstract

The purpose of this study was to determine if self-directed maintenance teams are developing into a structure for improving maintenance performance and lowering costs with minimal supervision. The study will survey the members' perceptions and effectiveness of the existing maintenance teams. The research data collected will help to determine a course of direction to improve the performance of the self-directed central maintenance teams.

AN INVESTIGATION INTO THE BENEFITS ASSOCIATED WITH SELF-DIRECTED WORK TEAMS

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by
Brian J. Moffatt
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Approved by:

Rex W. Pershing

Graduate Faculty Member

Feb 18, 1994
Date

Scott C. Helzer

Advisor

Feb-18, 1994
Date

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Chapter 1

Introduction

The self-directed work team may be the most significant factor in determining the long-term success of any manufacturing organization. Several management theories have been practiced through the years some of these are Management by Objectives, by Peter Drucker, Motivation and personality by the work of Abraham Maslow and Douglas Mcgregor who developed theory-y, theory-x type descriptions of management leadership. Frederick Taylor originated and developed scientific management. He believed there was one best way to do a job, and formulated piece work standards.

Today we are looking at a new concept labeled self-directed work teams. This is the new style of the late 1980s and early 1990s.

The significance of this new style lies in the fact the change is happening now. Supervisors and managers are in the middle of the change. The future success or failure of self-directed work teams will be determined on how well we adapt to change.

The work force has been accustomed to the authoritative supervisor delegating, and showing each employee how to do tasks. This caused employee's only to do what a supervisor wanted. The employee's didn't have much say in how they did their work. The employee's were never given empowerment to do things for themselves. They often asked for direction.

The work force now is caught between the past and present management structure. Suddenly they have power to do things for themselves. They are having problems with the new freedom. The job at hand is to change their behavior.

The biggest mistake organizations make is to confuse the acquisition of knowledge with the acquisition of skills. Some companies provide knowledge about skills through lectures and printed material, and believe they are providing actual skills. What happens,of course, is that the trainees do not change their behavior. Just as you can't teach someone to swim by the lecture method, you can't teach team skills without showing correct behavior and by providing practice opportunities with accurate, esteem-building performance feedback (Byham 1991).

The supervisor has to change his or her behavior role when working with self-directive teams. Behavioral patterns must change. A risk to the supervisor is the sharing of power. Coaching and developments of employees are critical roles of modern supervision today.

"Leadership is not a gift, it is a long term commitment." As such, it can be the critical difference between successful and ineffective work teams and organizations (Flores,1992).

Industry is under constant change. Global competition has created an atmosphere in industry that created a management direction toward the operating team concept. Industry has changed from a dominate strong autocratic

leadership style to a present operating team concept. Many levels of hierarchical management have been eliminated and many more will vanish.

The self-directed work team is becoming the more prominent form of improving productivity and solving problems in our United States manufacturing firms.

Problem Statement

Since the early 1980s, American businesses have been examining their leadership styles. Consequently, it was determined that the age old military style was no longer effective. The loss of American industrial dominance occurred when the competition became global. As a result of the rethinking of management theories, a variety of strategies surfaced thought to replace the top heavy hierarchical structure (Byrne 1993). Some new groups emerged. They were called autonomous work groups, self-directed work groups, total quality management teams. As this cultural revolution unfolded, it became clear which path to follow to succeed.

A medium-size midwest foundry was one of those many businesses who examined its leadership structure. In 1984, this business began a change process by implementing problem solving work groups (PSWGs). Within two years the strategy changed from PSWGs to operating teams, creating 100%

involvement versus the 10% with PSWGs. Since 1992, this business has begun to develop self-directed work teams.

The problem of this study was to examine the effectiveness of self directed maintenance teams with less management intervention. This study will also demonstrate perceptions of employee's working in teams.

Purpose Of The Study

The purpose of this study was to determine if self-directed maintenance teams are developing into a structure for improving maintenance performance and lowering costs with minimal supervision. The study will survey the members' perceptions and effectiveness of the existing maintenance teams. The research data collected will help to determine a course of direction to improve the performance of the self-directed central maintenance teams.

Statement Of Need

The need for this study was based on the premise that world market competition is driving many manufacturing firms to reduce costs to stay competitive.

As worldwide Competitive pressures increase, companies must respond with widespread cost cutting. One trend, downsizing of middle management, reaches all industries in all areas of the country (Zenger,1988).

The basic premise in manufacturing is to produce a quality product with the lowest cost. In this environment the self-directed work teams are becoming a solution to the need. The idea was to reduce middle management positions and put more responsibility toward team concepts for productivity improvements.

The study is worthwhile because the traditional management principles are difficult to relinquish. We need a study that will meet the changing economic environment we live in. The days of easy and effortless global dominance by United States firms clearly have passed, replaced by conditions that require executives to use every possible tool to create and maintain organizational effectiveness (Nadler 1992).

Research Questions

The following questions were asked as a result of this study:

1. Is there performance evidence that supports the theory that self-directed work teams increases productivity?
2. Do employees view themselves as more productive?
3. Does data support the concept that self-directed work teams decrease management personnel?
4. Is there a willingness of the central maintenance members to accept a higher level of responsibility in a self-directed team?

5. Do employees show a sense of ownership of their work, as a result of self-directed work teams?

6. Do employees show more responsibility and accountability as a result of being part of a team?

Assumptions

In the pursuit of this study, the following assumptions were made:

1. A midwest foundry will be the site for self-directed team research. The employment level at this foundry can reach as high as 1000 employees.

2. The central maintenance skilled trade work teams will be under study at a midwest foundry. The skilled trade teams consist of electricians, sheet metal, plumbers, pattern makers and mechanics.

3. All agreements will be adhered to with the United Auto Workers and Pattern Makers League of North America unions at this foundry. These agreements follow contract language agreed upon by company and union for a given period of time normally three years. These agreements include language in the contract that determine, retirement benefits, seniority, wages and vacations.

Statement of limitations

The study was conducted in view of the following limitations:

1. The sample was limited to the business teams of central maintenance.

2. Management designates foundry central maintenance area for the study.

3. The observation of the population will be conducted by a person working in central maintenance.

Statement of Delimitation

4. All guide lines will be followed of the two local unions.

Definition of Terms

The following terms are defined to clarify their use in the context of this study:

Self-Directed work team - A highly trained group of employees, from 6 to 18, on the average, fully responsible for turning out a well-defined segment of finished work(Orsburn 1990, p. 8).

Empowerment - Creating opportunities for action, when a team has power to gets things done(Blanchard 1990, p. 105).

Delegation - Giving to employees both authority and work that was formally carried out by their immediate manager; granting authority is the heart of delegation(Steinmetz 1992, p.545).

Supervisors - Individuals who are responsible for planning, organizing, directing and controlling the work of employees who perform the tasks and services of an organization (Steinmetz 1992, p.553).

Scientific Management - Concept founded by Frederick Taylor and dedicated to the use of scientific methods to find the one best way to perform a job (Steinmetz 1992, p.552).

Theory Y - Managerial assumption that, given encouragement and opportunity, people will control themselves, prefer to do a good job, and seek added responsibilities (Steinmetz 1992, p.553).

Theory X - Douglas McGregor's designation for traditional management; assume that people must be tightly controlled, that they dislike work, and that they are basically lazy and irresponsible (Steinmetz 1992, p. 553).

Machine bureaucracy - Organizations should be built around a clear system of hierarchical relationships, Organizations should be governed by a clear and consistent set of written rules and procedures covering all positions both operational and managerial. Job holders should be qualified to perform their assignments; therefore technical competence should be the basis for filling jobs for

promotion. Machine bureaucracy is a combination of Frederick Taylor and Max Weber management theories (Nadlar 1992 p. 112).

Management by Objectives - Based on Peter Drucker's admonition that management can only be judged by results, organizations began to develop objectives for their total structure. (Steinmetz 1992 p. 394).

Productivity - An improvement in manufacturing methods such as set up time and tear down time. The end product is increased without additional expense.(Orsburn 1990 p.15).

Chapter 2

Review of the Literature

No one knows exactly when management began. It is likely that among the earliest prehistoric people there were leaders who decided on courses of action and planned what was necessary for survival. Some of the earliest writings found by archaeologists were made approximately 6,000 years ago by the people of Sumer. They recorded business transactions that involved directing many activities of many people. Since a great deal of labor in early civilizations was accomplished by slaves, motivation was based on threats of punishment, whippings and beheadings (Steinmetz, p.7).

For the last 100 years employees were under threats, fear of job loss or pay loss, unfavorable assignments, and unfavorable performance evaluations as whips and swords to control employees.

The traditional form of management is a type that has many levels of management and depicted in a pyramid structure. This structure represents a form of management that has been around for the last 200 years. This form exists very strongly today and many manufacturing industries use it.

The Shareholders, Board of Directors, and CEO were on top. Workers and customers were on the bottom. Between the two were many layers of management. This system is finally

changing because its flaws are proving to be costly and even fatal.

According to Harper (1992) some major flaws are:

1. This system is slow. It takes too long for communication, information, decision-making to go up, down and sideways. A lot of good information never gets where it should be and is distorted on the way.

2. It's a wasteful system. It separates "thinkers" from "doers" and quality suffers. Too may people are checking others after mistakes have been made. This waste makes for higher costs and is no way to be competitive.

3. It is not customer-driven and often ignores the whole purpose of business: to serve customers. Customers who feel ignored take their business elsewhere.

4. It doesn't respond to changing customer needs and market demands.

5. It fails to motivate employees at the bottom who often have dull, fragmented jobs.

Shaw (1992) relates that the 1990s may witness the beginning of the end of the traditional organization. A century dominated by a single type of organization-the machine bureaucracy-is slowly giving way to a new era. This is driven by the eight forces (technology competition, oversupply, globalism, customer expectations, government participation, ownership, and work force dynamics).

Organizations are being forced to reshape themselves to survive and to prosper.

Shaw (1992) also states that teams will be the norm at all levels within organizations. Rather than a rigid formal structure, the organization will be more organic, adapting to changing conditions and the current load. Most productive work will be accomplished by small teams assisted by technology support.

According to Gerstein (1992) subunits and teams will be relatively autonomous in comparison to previous organization eras. Rather than providing traditional supervision, managers will coach, assist with problem solving, and provide linkage to top management. Teams will have much more latitude to solve problems and much greater access to resources than in the past. Because of the reduction of traditional supervisory responsibilities, organizations will tend to be flat, with few middle managers overall.

In the early part of the twentieth century the basic principles of "machine bureaucracy" by F. W. Taylor and Max Weber emerged. These organizational structures are still the prominent structures we think of today. We unconsciously equate the machine bureaucracy model with the process of organization: it is difficult for us to think of any other way of structuring work enterprises (Nadler 1992).

There are considerable forces that have increased pressures on manufacturing. They are new technologies, competition, globalism and workforce dynamics. These types

of forces will influence new organization forms and according to Nadler:

> Autonomous work teams. Self-managed teams that are responsible for an entire piece of work or a complete segment of a work process will become more prevalent. Such teams provide their own supervision, cross train and change roles, and in many ways are empowered to take responsibility for their own process and results. Autonomous work teams have been used extensively in factory settings.

The study must take into account why current management shuns traditional managerial concepts and embraces a different way of thinking and behaving. The new movement is characterized by:

> Employee empowerment, self management, and meaningful delegation versus centralized planning and direction.
> Macro-management versus micro management.
> Management by objectives' versus management by detailed direction.
> Theory Y versus Theory X management.

Many people now believe that an organization can be successful in the 1990s only when it implements such new wave concepts and takes advantage of the flexibility, motivation and improved use of human resources that will result(Gautschi March 1992).

Another important issue for the research is the changing work force. These changes include race, education level, and age distribution and are creating a work force radically different from that of the past.

Some typical results of successful self-directed teams are:

> Xerox Corporation plants using self-directed work teams are now thirty percent more productive than conventionally organized plants.

Proctor and Gamble gets thirty to forty percent higher productivity at is eighteen team-based plants.

Textronix Inc. report that self-directed work teams now turn out as many products in three days as it once took an entire assembly line to produce in 14 days.

Federal Express cut service glitches, such as incorrect bills and lost packages, by 13 percent.

Results like this, common in companies willing to stick out the sometimes painful period of transition, emphasize the unique ability of self-directed work teams to shrink bureaucracy and revive employee motivation with a single competitive strategy(Orsburn 1990).

In today's business environment management's ability to meet the competition head on will determine the success or failure of the manufacturing firm. The competition is using self-directed work teams as one segment of improving productivity and reducing costs.

Our ability to cope and manage with global competition and changing economic times will require organizational change. One of these changes is the use of self-directed work teams. "It's quite positive that organizations and senior management are leaning toward empowerment and that they see self-direction and self-direction work teams as a viable means to helping their organizations compete" (Verespel, 1992, pp. 30-32).

Chapter 3

Methodology

Subjects

The sample for this study was selected from a total population of 62 skilled trade employees at a Midwest foundry. The population was composed of mechanics, electricians, pattern makers, sheet metal fitters, plumbers and environmental operators. This population performs maintenance work from a business unit called central maintenance. The central maintenance business unit has stressed a self-directed team approach to accomplishing maintenance work.

Instrumentation

A questionnaire was developed as a mean to collect data for measuring the perceptions and effectiveness of the maintenance self-directed work teams. This questionnaire asked 19 questions pertaining to their perceptions working in a self-directed team environment. The factors which were asked in the questionnaire were questions related to 1) accepting responsibility; 2) job satisfaction; 3) control of work performed; 4) information received; 5) Is it easier to perform work today than previously; 6) effects of management reductions; 7) effects of day-to-day operations with less supervision; 8) ability to make contributions to central

maintenance; 9) customer satisfaction; 10) Availability of tools to complete work; 11) understanding central maintenance concepts; 12) merit review feedback; 13) work direction from supervisor; 14) timely performance feedback.

Data Collection Procedures

This questionnaire was administered at the end of the operating team meetings, with a total answering time of 10 minutes. The individual supervisor left the room after the questionnaire was handed out. The questionnaire was voluntary and no personal identification was required. The questionnaire was given to first and second shift self-directed teams. Another instrument used was the naturalistic observation technique for observing teams working in their natural environment. A trained operating team facilitator and the researcher observed natural working performance of the teams. In this setting nothing was altered only to study the teams and record effectiveness as it normally occurs. In this environment the observer was looking for contributions, accepting responsibility, and the working together as a team to accomplish work.

The financial services department provided records of how many salary personnel were employed from the years 1980 to present. This information was to establish credibility that management personnel have been reduced to reinforce that more responsibilities have been passed to the self-

directed work teams. The financial services department also provided data expressed in man hours per ton to show productivity. Lower man hour per ton is a positive productivity gain associated with foundry production.

Design and Analysis

The 47 survey questionnaires used in the study will follow a statistical method of evaluating each question answered. Each question asked will be totaled as a number response and then summed. This will give a distribution of values of each question asked.

The questionnaire survey will be summarized by using descriptive statistics. With the use of descriptive statistic's the mean, mode, and percentage of each question will be expressed in a simple explanation. The results of each question respondent scored values will be shown in a table format. This table will show the totaled breakdown of scores of each question asked. The results of each question answered reveal the mean and mode of each question asked.

All of the results of the questionnaire, the naturalistic observations and data collected through the financial services department, will be interpreted to answer the research questions.

Chapter 4

Report of The Findings

Questionnaire Survey

A questionnaire was developed and answered by 47 members of the self-directed work teams in central maintenance. A total of 50 questionnaires was issued. This represented a 94% return rate. The listed questions used for the survey of the self-directed team study in central maintenance (see Appendix A for a complete questionnaire listing).

Table 1

Question 1. I am able to accomplish my job responsibilities more easily today.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	2	5	8	10	11	7	4

The respondents' data show that forty-four percent answered the middle and moderate portion of the question. Sixty-eight percent of the responses perceive that job responsibilities are slightly easier to accomplish today (from midpoint to ideal). The responses would be more suited if the ratings were in the ideal category. The mean and mode were 4.3 and five respectively.

Table 2

Question 2. I have more control of my every day work.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	3	3	6	5	10	8	11

The respondent's showed a very strong perception of having control of their everyday work, supported by sixty-two percent of the responses between moderate to ideal. The responses displayed only twenty-three percent from minimal to some. The mean was 4.7 and the mode seven.

Table 3

Question 3. I have more input into how I do my work than in the past.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	3	6	5	5	10	11	7

The respondents perceive that they have more input to decide how to do their work because sixty percent of the responses were between moderate to ideal. Thirty percent of the responses were between minimal and some. The respondents' data was very close to the responses in question two. The question mean was 4.6 and mode six.

Table 4

Question 4. Foundry business information is regularly presented.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	3	3	11	5	16	6	3

The respondent's perceptions indicate a stronger communication effort will have to be applied to improve that business information is regularly reaching all employees. Only fifty percent of the responses were moderate too ideal and thirty-four percent were minimal to some. The mean was 4 slightly higher than half and mode five.

Table 5

Question 5. I accepted more job responsibility.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	2	2	4	8	5	13	13

The responses indicate that a strong positive perception exists that employees are accepting more job responsibility. Sixty-six percent of the responses were over the moderate portion of the question. The responses to

this had a high mean of (5.2), with a mode of six and seven respectively.

Table 6

Question 6. My job satisfaction has improved.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	7	4	10	6	10	6	4

The respondents perceived that job satisfaction hasn't improved. The answers were kind of split both ways. The some and minimal response of this question was forty-four percent. The minimal scale indicated seven responses that data alone was fourteen percent. Forty-two percent of the responses went to moderate and ideal. The mean was 3.9. This question had a mode of three and five respectively.

Table 7

Question 7. I am able to make contributions to the business of central maintenance.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	6	8	7	5	10	6	4

Forty-six percent of the responses indicated to the minimal and some portion of while forty-two percent responded to moderate and ideal. The respondents' perceive a split between making contributions and not making a contribution to the business unit of central maintenance. The mean was 3.8 and mode five.

Table 8

Question 8. Central maintenance personnel are more responsive to our internal customer needs.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	6	8	7	5	10	6	4

The respondent's perceptions indicate a split between being responsive to our internal customer needs. Forty-two percent of the responses were at the minimal and some portion of the question. The minimal response was high. The moderate to ideal response was forty-two percent. The mean was 4 and mode five.

Table 9

Question 9. The reduction in the number of salaried support people added more responsibility with my job.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	12	5	2	5	11	9	3

The perception of reductions in salary support personnel appears that it had no effect in adding responsibility to employees. Forty percent responded to the minimal and lower portion of the question. There was 12 responses for minimal and that represented the mode. The minimal response was high and represented twenty-five percent. The mean was 3.8.

Table 10

Question 10. Information has been provided to perform my job.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	8	4	12	4	13	4	2

There was a strong perception to support that information has not been provided to perform their jobs. Fifty-one percent responded to the minimal and lower portion of the question. The moderate to ideal rating was forty percent. The mean was 3.6 that was about half. The mode

was five followed closely with three that showed 12 responses.

Table 11

Question 11. Appropriate tools are readily available to complete maintenance activities.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	6	9	10	8	7	4	2

Fifty-five percent responded to the minimal and some portion of the question. There was a solid perception to support that appropriate tools are not readily available to complete maintenance activities. The mean was 3.4 and mode three.

Table 12

Question 12. Central Maintenance is focussed on customer satisfaction.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	1	5	8	3	18	7	5

Central maintenance was focused on customer satisfaction because sixty-three percent responded between

the moderate and ideal portion of the question. There was a strong perception that maintenance supports customer satisfaction. The minimal portion of the question showed only one response, followed by five at the two scale. The mean was 4.6. There was 18 responses for five that represented thirty-eight percent and mode.

Table 13

Question 13. Performance feedback occurs timely.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	7	4	15	10	6	2	2

The respondent's perceptions show that performance feeds back doesn't occur in a timely manner. There was fifty-seven percent that responded to some and minimal portion of the question. Thirty-one percent of the respondents were in the three scale that represented the mode. The mean was only 3.3.

Table 14

Question 14. I accept more responsibility in performing my job.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	1	2	7	5	10	12	10

The respondents' perceptions according to the data say they are accepting more responsibility. Sixty-eight percent responded to the moderate and ideal portion of the question. The respondents' scores were consistent for five, six and seven. The mean was 5 that mean matched very closely with question five. The mean for question five was 5.1. There was 12 responses for six and ten responded to ideal. This question was very similar to question five and both responses are very close together.

Table 15

Question 15. I have more control over when and how I accomplish my job.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	2	2	6	12	7	10	8

Fifty-three percent of the responses answered the moderate to ideal portion of the question. There was a strong perception that central maintenance employee's have more control and how they accomplish their job. The mean

was 4.7 and employee's are thinking they are controlling their own work. The mode was four and that carried 12 responses and was twenty-five percent.

Table 16

Question 16. There is sufficient work direction from my supervisor.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	7	2	6	9	12	8	2

Thirty-two percent responded to the some and minimal portion of the question. There was a strong perception that not all central maintenance employee's receive sufficient work direction from a supervisor. The minimal response was seven. The mean and mode was 4 and five respectively.

Table 17

Question 17. Self-Directed teams handle the day to day operation with a minimum of assistance.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	4	1	4	13	14	7	3

There was a perceived indication that central maintenance employee's can handle the day to day operation

with a minimum of assistance. The respondents answer show fifty-one percent responded to moderate and ideal portion of the question. Fifty-seven percent of the respondents were at scale five and six. The ultimate trend would be better suited for the data to be more at the ideal scale. The objective was to have the employees handle the day to day operations on their own. The mode was five and that represented thirty percent of the response. The mean was 4.2.

Table 18

Question 18. My merit reviews are done in a fair and equitable way.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	12	2	4	8	9	8	2

Thirty-eight percent responded to the some and minimal portion of the question. There was a strong perception that merit reviews are not done in a fair and equitable way. The minimal response data was 12 out of 47. The minimal data represented the highest recorded data of responses. The minimal response represented twenty-six percent. The mean was 3.6 that was about half way of the scale. The mode of one indicated 12 responses.

Table 19

Question 19. I understand more about central maintenance than I did previously.

	Minimal		Some		Moderate		Ideal
Scale	1	2	3	4	5	6	7
Response	6	2	8	9	11	8	2

This question was a toss up. Thirty-six percent responded to the some and minimal portion of the scale. Forty-four percent thought they understood more about central maintenance. The results by employees are perceived that central maintenance roles are not very well defined. The mean and mode were 4 and five respectively.

The responses from the questions used for the survey can be seen in a histogram format (see appendix C for a complete histogram response for each question asked).

These findings represent a cross section of the skilled trades that work in the central maintenance business unit. The questionnaire findings indicate that the weighted scale is over 3.5 out of a scale of seven of all questions asked. The results indicate a representation of perceived trends associated with self-directed teams working in the business unit of central maintenance with less management intervention.

Observation

Data from the Foundry Financial Services Department supported the number of salaried management personnel from 1984 to present. This total represents the whole foundry as shown in Table 20.

Table 20

Total number of salary support personnel.

1984	305 salary working
1991	165 salary working

The representation of salary support personnel for the years 1984 through 1991 is represented in (Appendix B).
The measure of productivity is expressed in man hours per ton as shown in Table 21.

Table 21

Total man hours per ton.

1984	14.8 man hours ton
1991	12.5 man hours ton

The information in table 21 indicates man hours per ton from 1984 to 1991. The man hours in 1984 were at 14.5 and today the man hours are at 12.5. The man hours per ton

through the years 1984 to 1991 are represented in (Appendix B).

The central maintenance business unit had a total of three salaried planners and six supervisors. The pattern makers had two supervisors. They had a supervisor on first shift and one on second. The sheet metal fitters, and plumbers had a supervisor on first and third shift. The electricians had a supervisor on first and second shift.

The business unit of central maintenance employed three full times salaried planners last year. Today there is one planner employed in central maintenance. In addition's supervisors today covers other areas of responsibility. One supervisor will cover several trade groups instead of one. The supervisor of maintenance who maintains building and grounds has responsibility for directing the work of electricians, plumbers, sheet metal fitters, mechanics, and production employees working with an environmental process. The total number of employees he supervises is twenty-five. Ten years ago the ratio of employees supervised was eight to one. Ten years ago there was only one trade group supervised.

The reduced management intervention that is an occurring in central maintenance is a direct result of the initial implementation of the problem solving work group evolution into self-directed maintenance team in 1992.

Naturalistic Observations

The observations taking place with the use of self-directed maintenance teams are:

1. The day shift electricians take a more positive approach in their daily work performance. Today they generate their own work orders for the jobs performed. Today they purchase their own parts through the stock room system. This was achieved by working with the computer systems installed in their area. Training enabled the electricians to learn the computer call functions required for ordering parts as well as making their own work orders. A positive teaming effect was observed in some instances. For example, when a department calls for assistance from an electrician, if the electrician on call was busy, another electrician responds to the call on his or her own without work direction.

2. Today the sheet metal fitters also order their own parts and generate work orders. A unique occurrence was observed with this team. They schedule themselves to work on second or third shift depending on when the equipment to be repaired is available. This team also develops internal bids to determine if they are competitive with the outside contractors in order to keep the work themselves. This team also shares their ideas on the best way to do a job with the engineering department.

3. The team composed of plumbers seems to struggle the most with developing as a self-directed maintenance team. Some members of this small team appear to still like the traditional method of supervising. Certain plumbers must be told to do each task required. They resist taking on additional responsibility as observed other groups in central maintenance. A portion of plumbers takes on the added responsibility like other groups. Only a small portion of the team does not. It has been very difficult for them to get into a full self-directed model. Personality conflicts are a primary contributor. Because of this, they do not share information with one another nor do they insure that job responsibility was carried forward to the next shift. A recent observation of this occurred when a plumber assigned to preventive maintenance was on vacation. The remaining team members did not take over the preventive maintenance assignment unless the supervisor told them to do so. Cooperation is lacking between this group. There is slight evidence of some positive changes. Recently one plumber suggested a solution to a problem during a team meeting. He suggested trying an air bag to plug a pipe so water wouldn't fill a pit while a conveyor was running in the pit. The suggestion was an easy solution to that particular problem.

4. The truck mechanics are accepting more responsibility by ordering their own parts and working as a

team. They seem to be concerned about repairing the vehicles. They too generate their own work orders.

5. The environmental system operators are a very good team. They operate a highly technical process. They process sludge that comes from dust collection systems. The process uses many pumps and chemical additions to settle a wet slurry and send it into a press operation for final squeezing to make it a hardened waste product that goes to a landfill. The system is operated through electronic touch screens to control the process. The operators order all chemicals and do the preventive maintenance with the system. They keep the supervisor very informed of the condition of the system. Testing and recording of the results were performed by the operators. They work extremely well without direct supervision.

These observations were examples of self-direction that occur daily on the shop floor.

Chapter 5

Summary and Conclusions

Questionnaire Conclusions

The results of the questionnaire were favorable. The total questionnaire mean was 4.16 that was more than half out of a possible range from one to seven. The result of self-directed teams accepting more responsibility was very supportive. The two questions answered which pertained to responsibility were very similar and both responses had a mean of five. The trends on those questions were leaning toward the ideal. Over all the responses from the questionnaire were positive. The results of the questionnaire show that there are improvements to make. The questionnaire clearly shows that some questions that were answered will need more attention to make improvements than other questions. The total distribution of the survey taken was close. The ideal responses were very close to the minimal responses.

Conclusions

The naturalistic observations on the self directed teams associated with central maintenance appear to be favorable. The reason they are favorable was because there seems to be a willingness by the teams to work without close supervision. The self-directed teams are making work orders

and ordering parts on their own. There is still room for improvement for each worker to become more proficient in making work orders and ordering parts. This generation of worker is caught in the middle of what was once a strong authoritarian management structure to the current self-directed. The theory of empowering employees to do task that was once done by supervision was out of question a few years ago. In some instances if a job wasn't done exactly as a supervisor wanted it the worker could be reprimanded and some were. The transition to a self-directed mode with the existing older worker will take time. The reason for this is a worker has to unlearn the old traditional management style.

A supervisor role must change from being a dominate ruler to a coach. This change from being authoritative to cooperative will be difficult for a supervisor who once had power and now must share it.

The supervisor will have to be more diversified and will be responsible for many departments. A supervisor will have large groups of workers reporting to him.

Summary

The style of management that directs the activities of workers is changing. The traditional management style of the last 100 years is being challenged. The new form of management style is self-directed work teams. This new

style is giving empowerment to the work force. The work once performed by a supervisor is now being done on the factory floors of America by the workers themselves.

The need for change was brought about by competition and world market conditions. The trend to survive in business is to do with less. Many firms today are announcing mass retirements and layoffs. The major 500 corporations in America are making headlines daily by announcing cut backs. These cut backs are taking place in the salary work force as well as the hourly. AT&T alone removed 75,000 people, many of them middle managers: and downsizing by Fortune 500 firms means approximately 500,000 plus people have been dismissed(Zenger 1988).

The management style of the 1990s will be more of a top management structure going right to the factory floor teams. There will be less middle management involvement and decisions will be made more timely. The responsibility of the organization will be made up of all employees.

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Appendix A

Questionnaire Survey

CIRCLE THE RESPONSE THAT MOST CLOSELY MATCHES YOUR PERCEPTIONS

1. I am able to accomplish my job responsibilities more easily today.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

2. I have more control of my everyday work.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

3. I have more input into how I do my work than in the past.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

4. Foundry business information is regularly presented.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

5. I accepted more job responsibility.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

6. My job satisfaction has improved.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

7. I am able to make contributions to the business of central maintenance.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

8. Central maintenance personnel are more responsive to our internal customer needs.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

9. The reduction in the number of salaried support people added more responsibility with my job.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

10. Information has been provided to perform my job..

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

11. Appropriate tools are readily available to complete central maintenance activities.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

12. Central maintenance is focussed on customer satisfaction..

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

13. Performance feedback occurs timely.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

14. I accept more responsibility in performing my job.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

15. I have more control over when and how I accomplish my job.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

16. There is sufficient work direction from my supervisor.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

17. Self directed teams handle the day-to-day operation with a minimum of assistance.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

18. My merit reviews are done in a fair and equitable way.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

19. I understand more about central maintenance than I did previously.

Minimal		Some		Moderate		Ideal
1	2	3	4	5	6	7

Appendix B

Financial Service Data

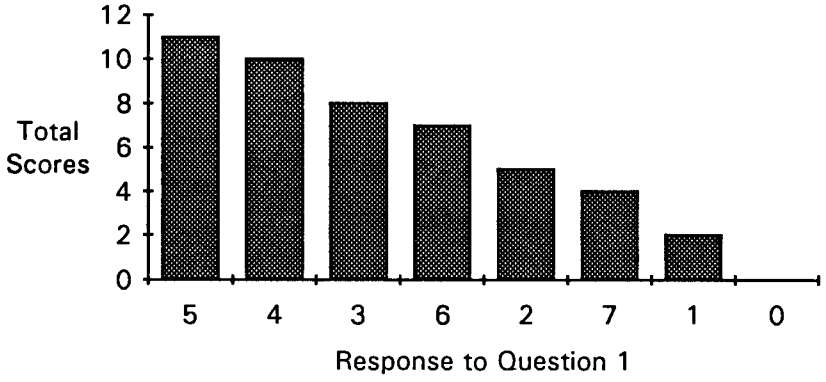
YEAR	ENGLISH TONS SHIPPED	PER DAY	ENGLISH TONS PRODUCED	PER DAY	AVG. NO. WAGE EMPLOYEES	SALARIED EMPLOYEES @ YR. END	MANHRS PER TON	YIELD	INTERNAL SCRAP % MAKE	EXTERNAL SCRAP % FSP	DAYS WORKED
1976	155147	708	154604	706							
1977	177035	744	177594	746							
1978	177333	721	179218	729							
1979	186683	833	185236	827	1817	373	17.3	59.8%	5.8%	4.8%	224
1980	192792	842	194056	847	1660	374	16.7	60.3%	6.1%	5.4%	229
1981	198030	825	197833	824	1534	353	14.4	61.7%	5.0%	4.2%	240
1982	145086	654	144310	650	1197	336	14.3	61.2%	5.2%	4.1%	222
1983	91360	421	90110	415	774	299	15	62.4%	5.4%	4.6%	217
1984	91164	390	91148	390	725	305	14.8	61.6%	4.4%	4.9%	234
1985	65372	296	65794	298	600	243	16.3	59.2%	4.2%	2.5%	221
1986	38289	153	39026	155	529	204	23.1	53.8%	12.1%	3.3%	251
1987	71637	272	73000	278	765	178	20.1	52.6%	13.6%	5.0%	263
1988	120724	497	125931	518	954	174	15.4	58.8%	7.8%	3.5%	243
1989	129861	562	127526	552	915	176	13.9	60.5%	6.9%	3.6%	231
1990	136221	565	136483	566	849	166	12.2	62.6%	5.7%	3.4%	241
1991-SEP	98435	456	98434	456	726	165	12.5	61.8%	5.6%	3.6%	216
FORECAST	109200	461	109700	461	759	165	12.5	61.8%	5.5%	3.6%	241

Appendix C

Histogram and Tables

APPENDIX C

Histogram 1



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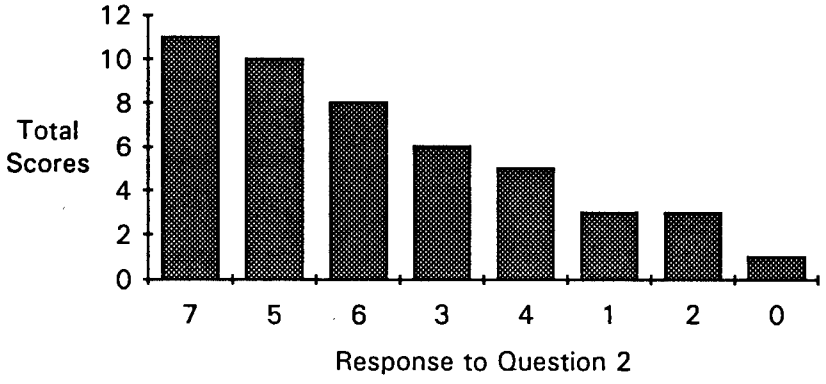

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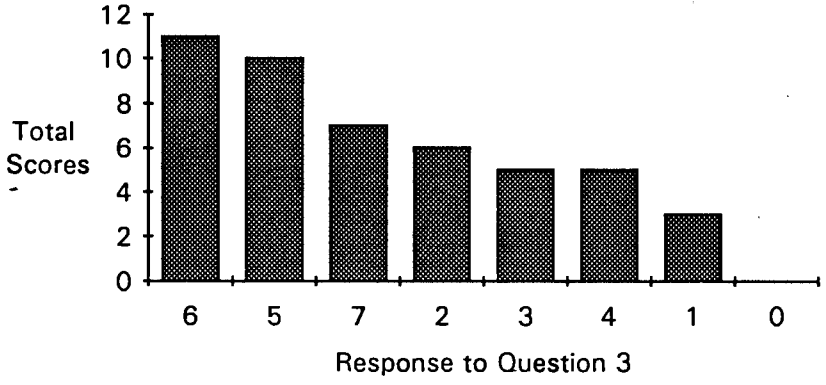

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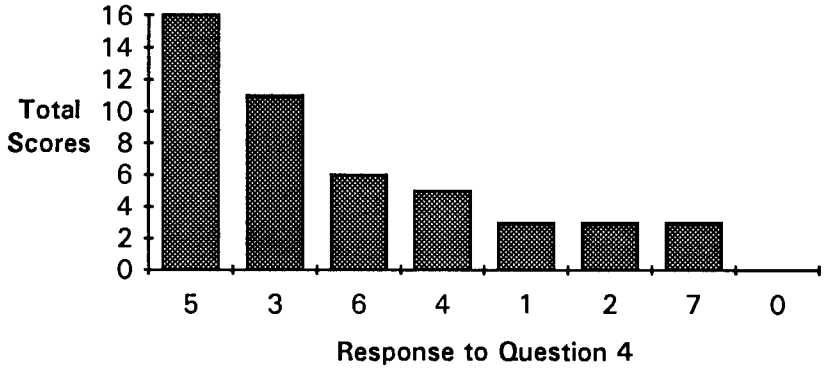

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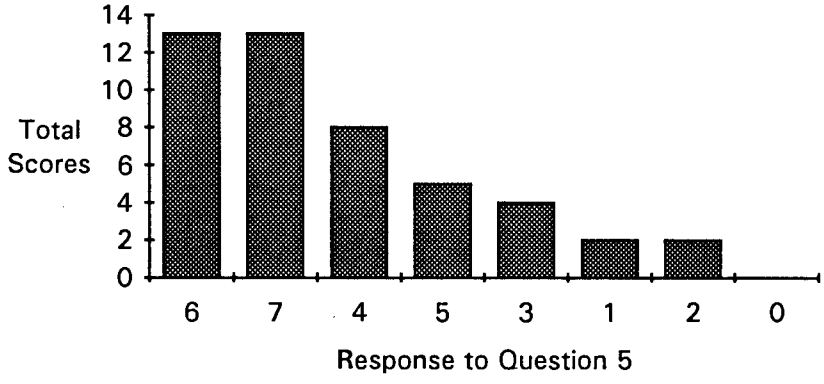

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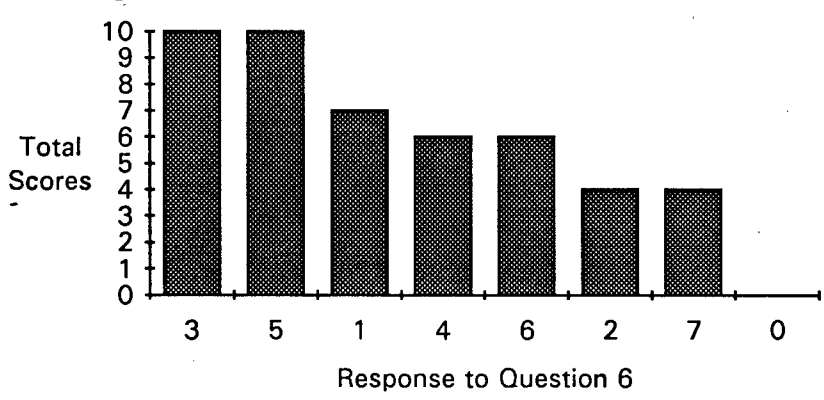

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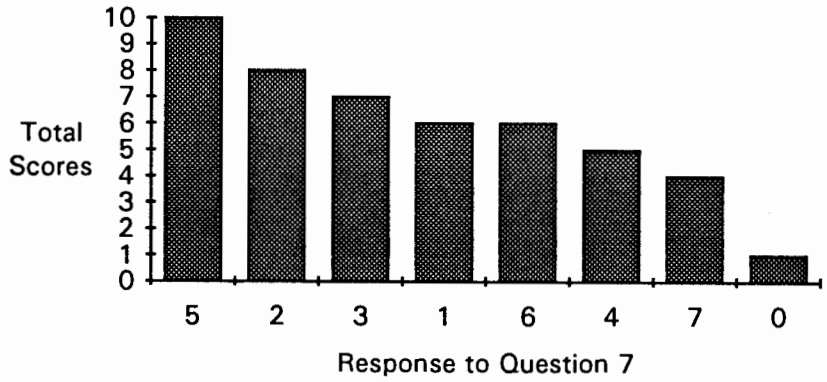

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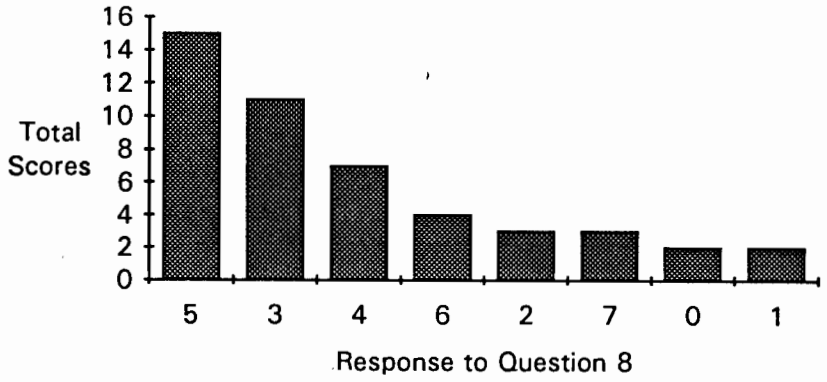

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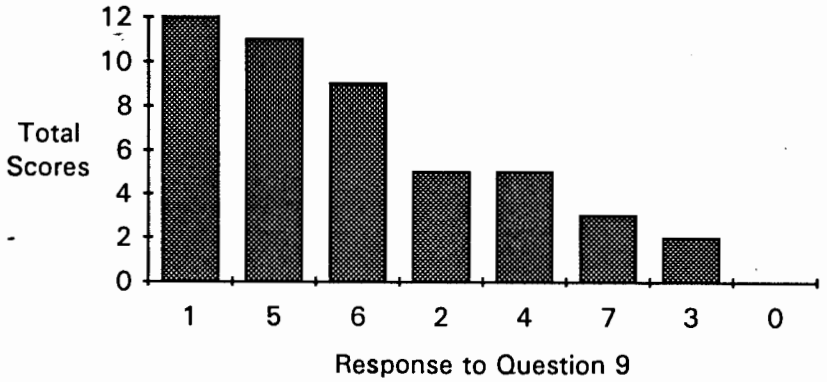

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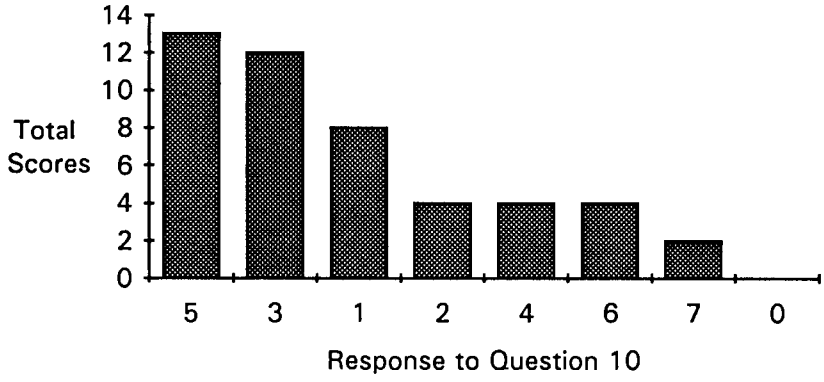

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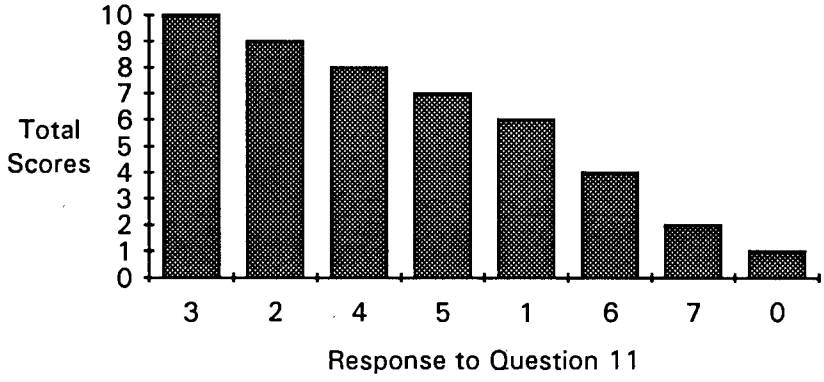

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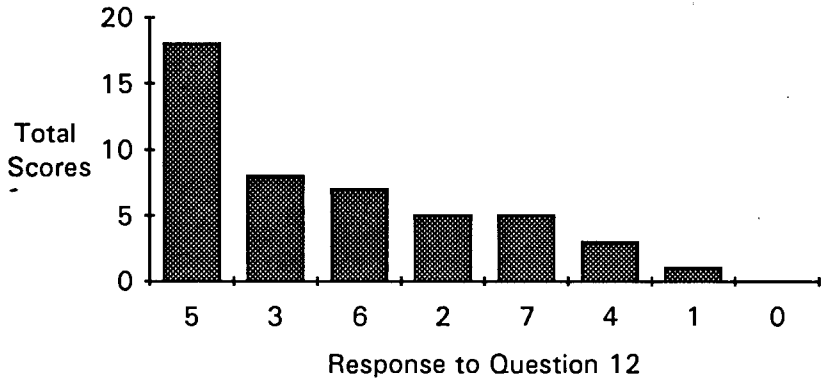

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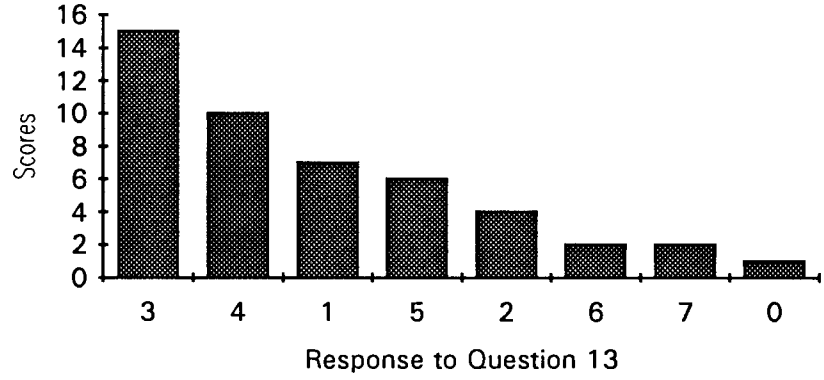

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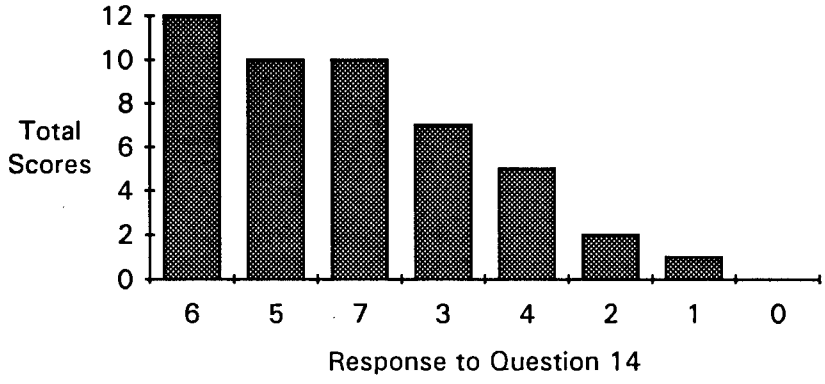

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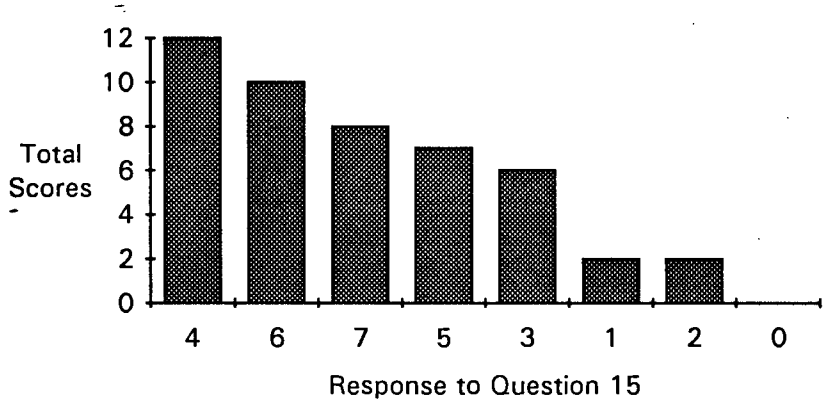

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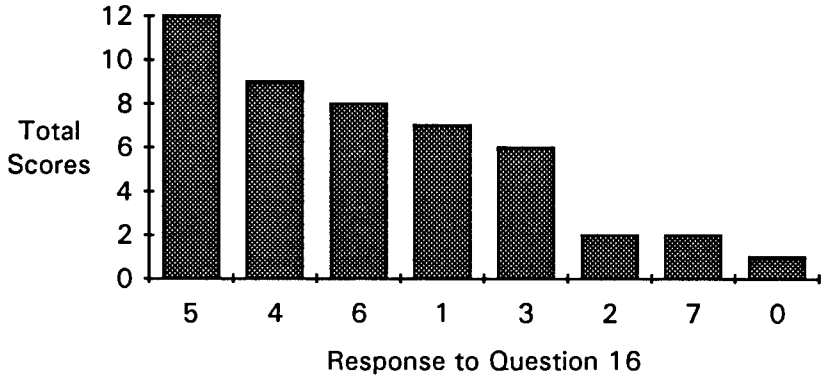

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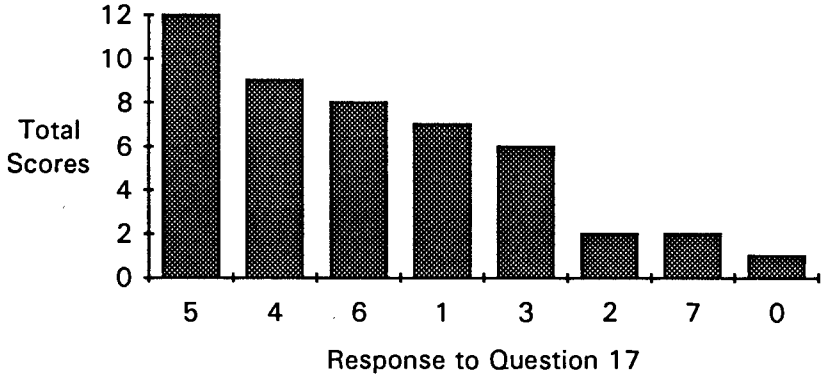

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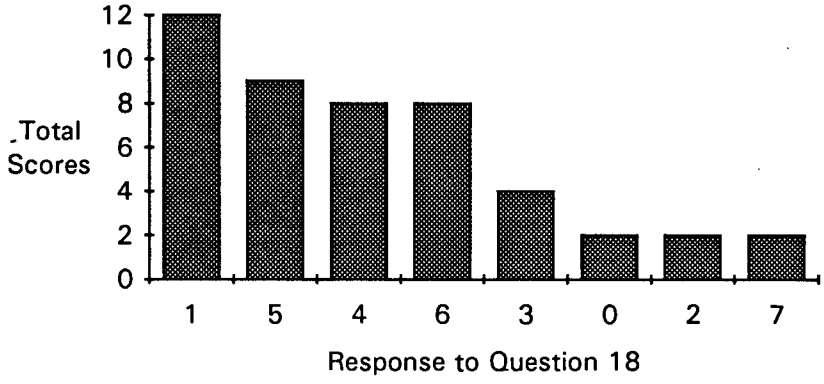

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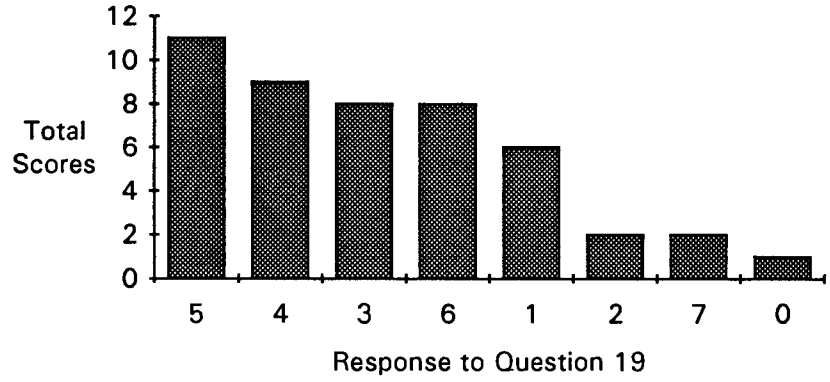

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Range		6
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Mean		4.723
Mode		7
Range		7
Table 3	Question 3	
Mean		4.574
Mode		6
Range		6
Table 4	Question 4	
Mean		4.021
Mode		5
Range		7

Table 5 Question 5	
Mean	5.2
Mode	6
Range	7

Table 6 Question 6	
Mean	3.893
Mode	3
Range	6

Table 7 Question 7	
Mean	3.765
Mode	5
Range	7

Table 8 Question 8	
Mean	4.021
Mode	5
Range	6

Table 9 Question 9	
Mean	3.787
Mode	1
Range	6

Table 10 Question 10	
Mean	3.638
Mode	5
Range	6

Table 11 Question 11	
Mean	3.382
Mode	3
Range	7

Table 12 Question 12	
Mean	4.553
Mode	5
Range	6

Table 13 Question 13	
Mean	3.319
Mode	3
Range	7

Table 14 Question 14	
Mean	5.0639
Mode	4
Range	6

Table 15 Question 15	
Mean	4.744
Mode	4
Range	6

Table 16 Question 16	
Mean	3.978
Mode	5
Range	7

Table 17	Question 17
Mean	4.425
Mode	5
Range	7

Table 18	Question 18
Mean	3.553
Mode	5
Range	7

Table 19	Question 19
Mean	3.978
Mode	5
Range	7