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THE EFFECTIVENESS OF A JOINT LABOR-
MANAGEMENT COUNCIL ON ENHANCING THE
QUALITY OF WORKLIFE AND INCREASING
PERCEIVED PRODUCTIVITY

⑩

James W. Fulton, Jr., Major, USA

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The level of productivity in the United States is decreasing. One approach for improving productivity within the DOD is to establish Joint Labor-Management Councils (JL-MC). These councils are intended to bring labor and management together in a cooperative, nonadversarial basis to address problems outside the collective bargaining arena. Where those problems involve the quality of worklife (QOWL) or aspects of productivity, it is anticipated that the JL-MC will reach solutions to improve the QOWL and/or the worker's perceptions of productivity. The DOD desired to learn the effectiveness of one such JL-MC in enhancing the QOWL and increasing perceived productivity. Pretest and posttest worker attitude surveys were taken a year apart in two experimental groups at a depot. The treatment group had a JL-MC established in it subsequent to the pretest, while the control group did not have a JL-MC. A factor analysis of the QOWL survey responses was performed. Eight orthogonal factors were extracted, and their factor scores were used in eight ANOCOVAs (for eight factors) to test hypotheses of no differences between posttest treatment and control groups while controlling for pretest differences. No statistically significant differences were found and the hypothesis of the JL-MC improving the QOWL or perceived productivity was not supported. However, this thesis represents an analysis performed at the midpoint of a longitudinal research design. In second quarter FY 80, an additional analysis will be conducted.

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THE EFFECTIVENESS OF A JOINT LABOR-MANAGEMENT
COUNCIL ON ENHANCING THE QUALITY OF WORKLIFE
AND INCREASING PERCEIVED PRODUCTIVITY

A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics Management

By

James W. Fulton, Jr., BSME
Major, USA

September 1979

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Major James W. Fulton, Jr.

has been accepted by the undersigned on behalf of the
faculty of the School of Systems and Logistics in partial
fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

DATE: 7 September 1979


COMMITTEE CHAIRMAN

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CHAPTER I

INTRODUCTION

Background and Justification

Industry generally includes any organization that converts raw materials into finished goods or else provides a service, and then makes these products available to interested users. The continued existence of a producer operating in a competitive marketplace is partially determined by the efficiency with which raw materials are converted to finished goods. A term associated with the efficiency of the conversion process is *productivity*, which can be viewed as a ratio of output per unit of input (17:13,52,59). Depending upon the industry, various raw materials are input to the process, labor being nearly universal among these materials. Inputs to the conversion process may be inefficiently managed, labor included, resulting in overall diminished productivity. The notion of limited resources is becoming more apparent to management, causing an increasing awareness of the need to optimize the utilization of all resources, as indicated by the following:

Increased productivity is a major goal of business and has long been accepted as a foundation for our constantly improving standard of living. Today, however, there is a growing reason for concern. Our annual

rate of increase in productivity has become one of the lowest among the industrialized nations. . . . Now, with problems in the areas of inflation, energy, raw materials, and labor, both commercial business and government face continuing pressure to increase, or at least maintain, output with dwindling productive resources [4:3-4].

Attempts at increasing productivity may be viewed by labor with a degree of contempt and distrust. Similarly, management has come to view most demands made by the labor force as ultimately increasing production costs which result in a reduced competitive position. A council made up of members from management and labor is one approach used to reduce the conflict that exists between management and labor under a collective bargaining setting. As council members, they are not pitted against each other, but enter the council with expectations of cooperation and perhaps with time come to the realization that their goals are not mutually exclusive. Their ultimate objectives are possibly complementary (8:59-60).

Labor needs the job security and good wages that efficient companies can provide; management needs the creative ideas about improvement that the man on the job can provide [11:2].

Labor and management both stand to gain by improving their organization's competitive position through increased productivity. The sense of urgency present in a competitive environment is not absent in the Department of Defense (DOD). For example, the possibility of contracting out work historically accomplished by government agencies to a

more efficient agency in the private sector represents competitive influence in the DOD.

Problem Statement

Sufficient empirical evidence is not available to validate the effectiveness of Council programs designed to enhance the quality of worklife and increase productivity (9:15 Jan 79). There are several methods by which programs approach this problem, one being to employ the combined efforts of labor and management in a working forum. Such a forum, known as the Joint Labor-Management Council, exists within the Department of Defense at a depot maintenance activity. The Department of Defense desired to know if this particular council has been effective in enhancing the quality of worklife and increasing productivity. This research attempted to respond to this question.

Literature Review

Management publications are filled with discussions of worker-related topics. The subjects typically focus around the quality of worklife, work humanization, job enrichment, and job satisfaction (17:68). Government officials and management have been pressed by social scientists to pay attention to the signs of industrial unrest (5:69). A background paper developed in April 1978 for the Conference on Productivity and Work Motivation in the Navy and Other Military Services focused upon the

situation of decreasing productivity in United States industry as being a signal to government, business, and labor that a problem was developing (16:1). The approach to the problem solution has been to focus on increasing output through better management of human resources. Experimentation was conducted during the years prior to 1970 primarily in the areas of job design, rewards given to employees, and increased employee responsibility.

The most recent efforts at problem solution built upon earlier experimentation, but with a new insight. The data indicated that quality of worklife was often improved as human resource productivity was enhanced (16:2-3). Productivity does not necessarily have to be given up in order to make employees more satisfied with work. The quality of worklife may be improved through job enrichment; however, the relationship between job enrichment and performance has not been firmly established (15:868). Often this relationship between job enrichment and performance has been intuitively drawn by some, only to be rejected by others for lack of empirical evidence. Data collected more recently suggests that a relationship exists. It has been suggested that the inconsistent results of earlier studies were due to methodological flaws where inappropriate techniques were employed and unreliable measures taken (14:16). The literature indicates a need for further research (4; 10; 15). Unfortunately, part of this need is a function of

industry often treating internal research on human relations as confidential and not releasable to the public, or else not doing the research at all because of not feeling the need, not knowing how, or perhaps not feeling the cost-versus-benefits tradeoff was satisfactory. For a variety of reasons, therefore, the results of much industrial research are not published, regardless of whether they are indicative of success or failure (18:76; 9:15 Jan 79).

A thought often seen in the literature is that when management creates conditions which workers perceive as beneficial to themselves, then productivity will be enhanced, thus, both sides profit from the situation (5:86). By way of contrast, collective bargaining is sometimes a win-lose proposition for the two sides involved. It follows that labor and management perhaps should come together in some forum other than collective bargaining, especially considering that neither union members nor union leadership appear to be interested in bargaining for job enrichment or quality of work issues (7:729).

The thrust of this research was to investigate the effectiveness of a Joint Labor-Management Council (JL-MC) as an appropriate forum for creating conditions which enhance the quality of worklife and increase productivity.

The Council Process

In response to the national concern over productivity, the National Commission for Productivity and Working Life was originally created by Congress in 1971 to encourage labor/management cooperative ventures, with the goals of increased productivity and improvement in the quality of working life (11:2). In November 1975, President Ford signed PL 94-136 changing the organization from a commission to a center (11:C3). In October 1978, the Executive Branch decided to dissolve the NCPQWL, and the Council Program was transferred to the Federal Mediation and Conciliation Service (FMCS). Starting in 1975, under the guidance of the Center, three defense agencies became involved with pilot programs in which Joint Labor-Management Councils were formed. The councils operated on a nonadversary basis, encouraging cooperation between labor and management while attempting to improve any facet of the work environment not otherwise covered by collective bargaining agreements (17:58-59). No empirical measurement of success toward improving the quality of worklife or increasing productivity was taken at these initial installations. The experiences gained via the pilot programs indicated that the council process had merit. The next site chosen for implementation was a defense depot maintenance activity. In

an attempt to achieve measurable results of council success, base line data were obtained prior to council establishment at the latter depot.

The process of the Joint Labor-Management Council program involves the use of a consultant who acts as a neutral third party, and who conducts a study in the organization of interest to learn whether or not establishing a council is feasible. If deemed appropriate by the consultant, joint labor-management relations training will occur prior to council establishment. If a council is appropriate and desired by all parties, a Memorandum of Agreement (MOA) is developed and signed by the commander of the activity and the local union president, the functional director involved and his chief steward, the chief of the division involved and his chief steward, and the co-chairpersons of the Council.

The fundamental concept of the council rests on a voluntary, cooperative relationship existing outside of the collective bargaining process. It operates under the MOA, which can be terminated by either party upon 30 days written notice. In addition to labor and management co-chairpersons, there are typically six to eight members of the council selected from among the ranks of labor or management. The council convenes periodically to address issues submitted directly to it by the employees. The council may address any subject of concern that does not

lie within the scope of collective bargaining or the Equal Employment Opportunity (EEO) process. Emphasis is usually on productivity and quality of worklife. The council fully researches and staffs each submission and either makes an appropriate recommendation to management or provides a written explanation to the submitter explaining why further action cannot be taken.

Research Objective

The research objective was to (1) establish the reliable factors measured by the Quality of Worklife (QOWL) Survey and (2) determine the influence of the JL-MC upon the quality of worklife and upon perceived productivity.

Research Hypotheses

1. It was hypothesized that the survey instrument contained 27 factors for reliably measuring worker attitudes towards their QOWL and perceived productivity.

2. It was hypothesized that either the quality of worklife or perceived productivity, or both, measured in the treatment group would reflect an improvement subsequent to the establishment of the Joint Labor-Management Council.

CHAPTER II

METHODOLOGY

Research Design

According to Emory, "the overwhelming advantage of experimentation is that no other method approaches its power to determine causal relationships between variables [3:302]." As the researcher moves from the optimum conditions of the laboratory to the realities of natural environments, he often has to depart from the ideals of a true experiment. In a *quasi-experiment*, some of the situational variables are controlled, but not all. *What* is measured and *when* it is measured can be determined, but the recipient of the experimental treatment and the timing of that treatment may not totally be determined by the researcher. Such was the case in this research.

The experimental design used in this research was similar to that described by Campbell and Stanley as the Nonequivalent Control Group Design (1:47-50). Two intact comparison groups were taken as they existed at the depot, one being used as the treatment group and the other as the control group. Pre-experimental equivalence of the groups was not assured, even though care was taken to select a control group that would be most similar to the treatment

group. A pretest was administered to both groups prior to the JL-MC treatment. The Non-Equivalent Control Group Design is regarded as controlling the main effects of history, maturation, and testing (1:48), and the effect of instrumentation was controlled by the design and by use of a printed questionnaire with instructions for employee responses. The effect of regression toward the mean could have posed a problem of internal validity to this design if either group was selected due to an extreme score on a pretest, but this was not an issue for this research. The potential for regression toward the mean was increased due to the treatment group having been identified upon the recommendation of the consultant from the FMCS. That is, the consultant recommended to labor and management that a JL-MC be established in a certain work unit, and that work unit became, therefore, the treatment group. Even so, the fact that members of the treatment group did not volunteer for the JL-MC makes the design stronger than a "self-selected" design (1:50).

The survey instrument was an attitudinal survey which was administered to both groups as a pretest and again one year later as a posttest (see Appendix A). The JL-MC was established in the treatment group during September 1978, subsequent to the pretest. Figure 1 portrays the research design and relates it to time.

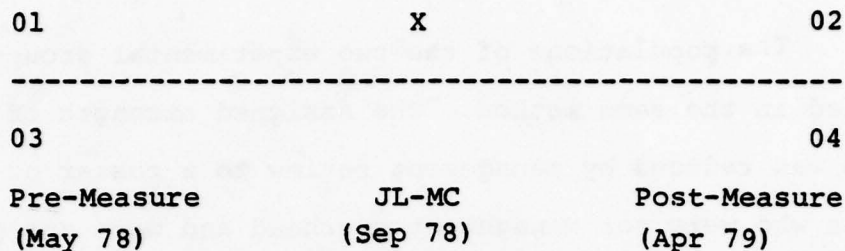


Fig. 1. Research Design

The treatment group was a division within a maintenance directorate at the depot, and identification of this particular division as a treatment group was the result of a recommendation made by the FMCS consultant after he conducted a feasibility study at the depot. The recommendation was accepted for implementation by the depot commander and the union president. The control group was also a division within the same maintenance directorate at the depot and was selected from a set of divisions within the directorate. Each division in the set was functionally similar to the division chosen for the treatment. Selection was accomplished by an individual from the parent organization of the depot. The main difference between any of the divisions involved in the selection process was in their maintenance operations. That is, the military hardware to which a division's maintenance effort was applied would vary by division. The general nature and degree of technical skills authorized within any division were not significantly different.

The populations of the two experimental groups were sampled in the same method. The assigned strength of each group was reduced by management review to a roster of people who were not management overhead and were not geographically separated from the place of work for the majority of the group. This reduced quantity, representing those available to be sampled, was multiplied by 25 percent. The resultant product represented the number of people from whom a survey response was desired. To compensate for possible no-shows, a factor of 10 percent was added to the 25 percent goal figure. The roster of available people was used to associate a sorted (ascending order) random number with each name on the roster, the roster being in alphabetical order. Another series of random numbers were generated until the size of the sample to be invited was reached. Matching the two sets of random numbers determined by name who would be invited. Management reviewed the list of those to be invited and replaced anyone they knew would be absent at the time of the survey. Replacement was by taking the next available uninvited name on the list. Letters were addressed to each designated person, signed by the division chief, instructing the addressee to report to a specific location at a certain time (during their shift) to participate in a job survey. Those invited did not know participation was voluntary until they actually arrived at the survey site. Not all persons invited showed up, with

the primary reason being excusal due to operational necessities. Administration of the survey instrument was accomplished by the same proctors for all respondents, but proctors used at pretest differed from those at posttest. The site of the survey for the pretest was the same for both experimental samples, however, it was not as convenient a site for members of the control group as it was for members of the treatment group. This inconvenience may have affected the number of personnel invited from the control group who actually showed up. At the posttest two different survey sites were used, one being convenient for members of the control group, and the other being convenient for members of the treatment group. At the pretest, 9 percent of the available control group population were surveyed and 18 percent of the available treatment group population were surveyed. At the posttest, the comparable percentages were 24 percent for the control group and 23 percent for the treatment group. Due to the control group having more management overhead and greater geographical dispersion than the treatment group, the control group yielded an available population just less than half that of the treatment group availability. At the pretest there were 73 usable responses collected from the control group, and 310 from the treatment group. At the posttest there were 169 usable responses obtained from the control group and 357 from the treatment group. It was desired to minimize the

interruption of normal operations, to enhance a respondent's sense of the confidentiality of their response, and to avoid the paperwork necessary to meet the legal requirements of the Privacy Act. For these reasons individual participants were not identified. The experimental groups, however, were structured into workgroups, and all questionnaires were coded indicating the workgroup to which the respondent belonged. Therefore, the smallest unit which could be identified and compared between pretest and post-test was the workgroup.

The Measurement Instrument

The same instrument was used to measure quality of worklife and perceived productivity for pretest and post-test treatment and control groups. The Quality of Worklife Survey consisted of 77 items, 4 of which dealt with categorical data about respondents, and 73 attitudinal items were designed to measure the respondents' attitudes toward QOWL and perceived productivity in their workgroups. The proponent for this questionnaire was the depot's higher headquarters. It was through the use of dimensions, or factors, based upon other research and similar instruments (10:199; 4:98) that the proponent constructed this questionnaire (see Appendix A). The first 70 attitudinal items were 7-point Likert scales which were designed to measure aspects of the QOWL. The first section (questions 1 - 5)

sought an objective description of the respondent's job. The second section (questions 6-52) questioned the respondent's personal feelings about their job. The third section (questions 53 - 64) dealt with how satisfied the employee was with certain job aspects, and the fourth section (questions 65 - 70) inquired as to the relative presence of specific job characteristics.

Questions pertaining to perceived productivity were in a single section (questions 71 - 73), and a Likert five-point scale was used. Each of these questions emphasized that a respondent's frame of reference should be limited to their workgroup.

Much of the literature considers the seven-point Likert scale to be ordinal in nature (3:250), and many authors therefore do not support the use of parametric statistics with such scales (6:45). Statisticians of the classic school maintain that data must be at least interval level for the use of parametric statistics, but there has been a change toward recognizing the difficulty in assessing absolute levels of measure (6:55). The current thought regarding the use of ordinal versus interval level scaling is summarized by Gardner.

1. The distinction between ordinal and interval scales is not sharp. Many summated scales yield scores that, although not strictly of interval strength, are only mildly distorted versions of an interval scale.

2. Some of the arguments underlying the assertion that parametric procedures require interval strength statistics appear to be of doubtful validity.
3. Parametric procedures are, in any case, robust and yield valid conclusions even when mildly distorted data are fed into them. Furthermore, if the distortions are severe, various transformation techniques can be applied to the data [6:55].

Based upon the foregoing discussion, this research assumed the Likert scales to be "mildly distorted" interval level data, and, in turn, allowed the application of parametric statistical techniques.

The proponent for the questionnaire hypothesized there were 27 factors for measuring QOWL and perceived productivity. A listing of these hypothesized factors and their component item numbers is in Appendix B.

An integral part of this research was the performance of a factor analysis across all responses (pretest and posttest taken together) to ascertain the correctness of the proponent's hypothesis, to investigate the factors' internal reliability, and to make recommendations based on the data for improving the survey instrument. The factor analysis was accomplished using a principle factoring with iteration method, minimum eigenvalue greater than or equal to 1.0 specified. The factors were orthogonally rotated with VARIMAX rotation, and factor scores were computed for use in subsequent statistical analyses. The computer procedures are as described in The Statistical Package for the Social Sciences (13:468-508).

For each factor, the items loading on the factor were rank-ordered in descending magnitude of their factor loadings. Cronbach's Coefficient Alpha was computed on the two highest loading items, then the three highest loading items, and iteratively down the list until either the top 10 highest loadings were included or the loadings decreased to less than .2900 (2:297-334).

Statistical Procedure

An analysis of covariance (ANOCOVA) design was used to provide statistical control for possible differences between pretest treatment and control groups. The data used as an input to the ANOCOVA were the computed factor scores. The criterion was the workgroups' posttest mean factor scores in the treatment and control groups and the covariate was the workgroups' pretest mean factor scores. Of primary interest was the detection of any significant differences between the criterion means of the two posttest groups, after adjustment for the differences between the pretest treatment and control groups (19:578-579). Campbell and Stanley noted that most pretest/posttest research has employed inappropriate techniques and therefore arrived at erroneous conclusions. Campbell and Stanley have therefore recommended that better control is provided through the use of ANOCOVA when what the experimenter desires is to control for pretest differences that

exist between treatment and control groups (1:23,49-50). While the control group in this experiment was selected to be as organizationally and functionally similar to the treatment group as possible, there was no assurance that they were matched with respect to the covariate. Any lack of covariate matching, or bias, may be removed by a covariance adjustment (19:580-581). There was no reason to believe the covariate scores differed greatly between the two groups, and so the cautions involved with substantial extrapolation of the regression lines and with any dependence of the treatment variable upon the covariate (or vice versa) were not held to be a problem (12:718). This experiment involved a single factor (i.e., posttest group) with two levels. The treatment group (level one) was administered the JL-MC program while the control group (level two) had no such program. It was assumed that the regressions were homogeneous, in addition to the other assumptions usually made with analysis of variance.

As previously mentioned, the workgroup was used as the smallest unit available for data analysis. Due to the circumstance of having, in some cases, very small or very unequal sample sizes in the same workgroup across the pretest-posttest timeframe, a few of the workgroups were collapsed together for data analysis. This new data analysis structure resulted in a total of 9 workgroups in the control group, and 12 workgroups in the treatment group.

The factor scores obtained from the previously described factor analysis were aggregated consistent with the collapsed workgroup structure. These scores were averaged within the workgroup and the results analyzed through analysis of covariance. Computer data processing was accomplished using SPSS Subprograms AGGREGATE and ANOVA (13:203-215,398-421).

The .05 level of significance was established for interpreting the results of the analysis of covariance. In so doing, it was recognized that the probability of finding at least 1 significant result would be on the order of 33 percent since 8 different factors would be examined (20:84).

The finding of a significant difference for any factor was considered to be sufficient to support the hypothesis of the JL-MC favorably influencing the QOWL and/or the perceived productivity in the treatment group.

Assumptions and Limitations

The assumptions of this research included the following:

1. The use of Likert scales provided data which approximated interval level data and therefore permitted the use of parametric statistical techniques.

2. The persons responding to the survey instrument represented the attitudes of the parent population.

The limitation to this research was that conclusions applied only to the data at hand, and any inferences made pertained only to the population which was sampled.

CHAPTER III

RESULTS

Factor Analysis

As a result of factor analysis, eight factors were extracted and orthogonally rotated to a terminal solution, with a minimum eigenvalue of 1.0 having been specified as a condition for extraction. The hypothesis of there being 27 factors associated with the survey instrument was not supported. Table 1 lists the eight factors extracted, their eigenvalues, the percent of total variance explained by each factor, the magnitude of the highest loading, and the number of items loading with a value of 0.45 or greater. All 73 survey instrument items were included in each factor when factor scores were computed, and the responses to those items marked with an "R" on the questionnaire (Appendix A) had their scales reversed before the analysis was performed.

Internal Consistency

Appendix C lists the eight orthogonally rotated factors together with the items that loaded highest on a given factor sequenced in descending order of loading absolute value. The item number corresponds to the question number on the questionnaire. Either the 10 highest-loading items were listed, or as many items as had a

TABLE 1
 FACTOR ANALYSIS*
 (Rotated Factors)

Factor	Eigenvalues	Percent Common Variance	Highest Loading	Loadings ≥ 0.45
1	15.28	48.2	.74	11
2	6.43	20.3	.78	9
3	3.08	9.7	.69	8
4	1.90	6.0	.64	8
5	1.71	5.4	.52	4
6	1.16	3.7	.83	3
7	1.13	3.6	.65	5
8	1.01	3.2	.48	1

*Analysis included 73 variables.

loading magnitude of .2900 or greater. The internal consistency of each factor was established by means of the Coefficient Alpha formula (2:297-334), and the internal consistency indices are provided under the column labeled "Alpha."

All 10 items listed under Factor 1 (Job Significance) were logically related to each other and to the construct of how significant the job was to the worker. Items 18 and 12 were the lowest loading of the 10 and the least correlated with the other items, and they were the only items asking how well the worker did his job as a

function of training and information he thought necessary to do the job well.

The first four items listed under Factor 2 (Growth Opportunity) seemed to measure how satisfied the worker was with his opportunities to learn more about the job. Beginning with item 53 (the point where the magnitude of Coefficient Alpha decreased slightly and then later began to increase), the worker was asked about relationships with coworkers and about his supervisor. Two of the three items concerning the supervisor were expressed in terms of coworkers and all three (items 41, 42, 54) loaded high on Factor 5, which was nearly homogeneous in measuring attitudes about the supervisor.

All items in Factor 3 (Pride in Performance) were logically related and seemed to be concerned with how motivated the worker was to do his job to the best of his ability, and what self-opinion was held of those abilities. As indicated by the Coefficient Alpha value, the intercorrelations among the items were not particularly strong. Factors 3 and 1 both dealt with the job, but the difference appeared to be that Factor 1 was concerned with only what the job meant to the worker (without special regard for skills or pride in work), whereas Factor 3 was more concerned with the dimension of pride in craftsmanship. That is, a craftsman might tend to do a job well even when the job itself had no great meaning.

The items listed first under Factor 4 (Overall Job Environment) dealt with resources, supervision, communication, and planning. The performance of the worker was not involved, nor was the job task. This factor indicated a dimension of environment, with the facets of peer and supervisor relationships, direction toward known goals, and status of job-related hardware.

Factor 5 (The Supervisor) pertained to the dimension of supervisor performance in terms of the frequency of communication with the supervisor and the quality of the communication, be it a concern for the personal affairs of the worker or the worker's job performance. Beginning at item 28 the internal consistency decreased and then subsequently increased. Item 28 introduced the coworker into the feedback loop, as did item 5, while items 66 and 64 dealt with the supervisor. Item 25 dealt with group spirit and did not logically relate to this factor or to any of the factors; it had a communality value of .29.

Factor 6 (Perceived Productivity) was internally consistent in measuring perceptions of productivity. The only three items in the survey dealing with productivity (items 71, 72, 73) loaded highest on this factor. The next highest loading on this factor was only .26.

Factor 7 (Autonomy) evidenced three interruptions in the serial increase of Coefficient Alpha in going down the list of high loading items. The items initially dealt

with the subject of decision making and then became involved with personal satisfaction and operational efficiency. Overall, the factor seemed to be associated with the worker's participation in a goal-seeking organization, and the extent to which the worker was satisfied with his role in goal accomplishment.

Factor 8 (Work Irritants) had an eigenvalue that met the minimum criteria of 1.0, but just barely so, explaining 3.2 percent of the total variance. The items listed under this factor had low intercorrelations and therefore comparably low Coefficient Alpha values. This factor appeared to measure a worker's motivation to persevere; to remain with the job.

Analysis of Covariance

The set of eight hypotheses tested for the respective eight factors were that for each factor the adjusted criterion variables (the posttest factor scores) between the treatment group and the control group were not statistically different. With Y'_{ij} as the adjusted mean posttest factor score, the model was

$$Y'_{ij} = \mu + T_j + E_{ij}$$

where μ is the mean, $T_{(j)}$ are the main effects of the treatment, and E_{ij} represents the error term. The hypothesis tested was

$$H_0: T(\text{treatment}) = T(\text{control}) = 0.$$

An analysis of covariance was performed for each of the eight orthogonal factors. The results are presented as conventional analysis of covariance (ANOCOVA) tables in Appendix D. Appendix E is a graphical presentation of the posttest mean factor scores, unadjusted and adjusted for the covariate pretest mean factor score, for the two experimental groups across the eight orthogonal factors.

At the .05 level of significance there were no significant differences found due to the main effects within any of the eight factors, and the eight hypotheses of no difference could not be rejected. The data indicate that the quality of worklife was not enhanced, nor was the perceived productivity increased due to the presence of the JL-MC.

Reference to the graph of unadjusted and adjusted mean criterion variable values (Appendix E) indicate that the greatest potential for a significant difference was at Factor 5, which related to the dimension of the supervisor. This potential was reinforced by noting that the ANOCOVA table for Factor 5 associated a probability value of .181 for the main effects F-statistic, and this probability was the minimum found for any of the eight ANOCOVA tables. The graph also reflects a minimal adjustment due to the covariate on any criterion variable.

CHAPTER IV

DISCUSSION

The Survey Instrument

The hypothesis predicting 27 factors could not be supported, as there were only 8 orthogonal factors extracted that had minimum eigenvalues equal to 1. The eight factors were not equally reliable, and all items were not necessary to reliably establish the factor. The results of the factor analysis indicated that the survey could be made more efficient by using for each factor only those top loading items which produced a sufficiently reliable scale. Increased efficiency could decrease the time respondents spent away from their jobs. The following is a discussion of recommendations for survey adjustment (refer to Appendix C).

Factor 1 (Job Significance) was sufficiently reliable with 10 items having an internal consistency index of .8575. These 10 items are recommended for retention in future survey instrument construction.

Factor 2 (Growth Opportunity) had an internal consistency index of .8676 computed over items 59, 55, 56, and 57. It is therefore recommended that these four items be used for computing this factor's index. All other items

are recommended for deletion from this factor because they either did not logically relate to the factor or loaded higher on Factor 5.

Factor 3 (Pride in Performance) had an internal consistency index of .7948 with 10 logically related items, and it should be retained with those 10 items.

Factor 4 (Overall Job Environment) had an internal consistency index of .9072 with 10 items logically related. This factor is recommended for retention using the 10 items listed in Appendix C.

Factor 5 (The Supervisor) had an internal consistency index of .8218 computed over the top 5 highest loading items (items 44, 33, 42, 54, and 41). To increase the internal consistency beyond .8218 requires a minimum of 3 additional items (items 28, 5, and 66), which provides only a .0105 increase in the index. It is therefore recommended that the first five items be used to compute this factor's index. The remaining items are recommended for deletion because they either did not logically relate to the factor (e.g., introduced coworkers), or did not increase the factor's internal consistency.

Factor 6 (Perceived Productivity) should be retained with 3 logically related items (items 72, 71, and 73) and an internal consistency index of .8744.

Factor 7 (Autonomy) had logically related items down through item 40 and an internal consistency index of

.7662. The remaining items did not directly relate to this factor and are recommended for deletion.

Factor 8 (Work Irritants) was not a strong factor in comparison with the others, in that it had a low internal consistency index (.6000). Therefore, this factor is recommended for deletion from the survey.

The net result of these recommendations is a survey instrument designed to sample worker attitudes about QOWL and productivity in terms of 7 factors composed of 45 questions. The 38 percent decrease from 73 questions to 45 questions should provide a more efficient instrument for measuring the QOWL and perceived productivity. It is emphasized, however, that any further measurements taken in the same experimental groups as were involved with this research would have to be made using the existing survey instrument. Otherwise the potential for the effect of instrumentation upon the experiment would increase.

QOWL and Perceived Productivity

There was no support for the hypothesis that the JL-MC would improve either the QOWL or perceived productivity. Although the .05 level of significance was used, there would have been no significant differences found at the .10 level either. In short, the failure to reject the null hypotheses of no differences was clear. There are at least three explanations for not finding statistical

differences between the treatment and control groups due to the JL-MC.

1. The JL-MC in fact had no significant influence over the factors measured by the survey instrument.

2. The JL-MC had an influence, but the influence dealt with factors not addressed by the survey instrument.

3. The JL-MC had no influence over issues stated by workers to be of importance to them.

There is no absolute answer to the question of which of the foregoing three explanations was operative. To discuss some of the events and circumstances surrounding the experiment may help to weight the explanations relative to each other.

The JL-MC usually met weekly and sometimes bi-weekly since it was established in June 1978. The membership of the council had minimal change throughout the course of the experiment. Rather than discuss the agenda of the council, it is more meaningful, in terms of the council's influence, to discuss actions that were implemented because of council recommendations. There were five such actions. One, microwave ovens were purchased and made available to workers who wished to heat food when cafeteria facilities were closed for business. Two, workers wearing bifocal safety glasses had their glasses modified (at no expense to them) in a way that physically facilitated their labors. Three, a second cashier was hired in the cafeteria to reduce the time

workers were queued-up to pay for meals during their brief lunch period. Four, a drape was fabricated to prevent a large shop door from admitting undesirable weather. Five, a telephone was installed externally adjacent to a work area security fence, thereby allowing communications with workers inside without having to go through the process of entering the security area. Therefore, lost time from jobs were reduced by this process.

Of these five actions, the one having to do with bifocal glasses directly relates to the job aspects of the survey instrument, and that relationship was in terms of tools and supplies necessary to do the job (item 7). All five actions implemented could have been brought to a respondent's mind whenever questioned about general conditions (items 4, 7, and 68). Comparison of what the survey instrument addressed with what the JL-MC tangibly accomplished for the workers, suggests that the survey instrument may not have been valid for what the council was doing. That is, not valid in the sense of measuring appropriate factors influenced by the JL-MC.

The remaining two explanations can be investigated by examining two subjects. First, it would be helpful to know what events of potential significance transpired and were not common to both groups, and second, it would be helpful to learn what topics concerned the workers.

With respect to historical events, there was a ruling made in April 1979 that all performance appraisals

with an awarded score of 95 or greater would have to be justified in writing (100 was maximum score). Such a ruling would tend to depress scores and would therefore concern workers having high performance ratings. It was announced six days prior to the posttest that employees would pay for parking consistent with President Carter's guidelines. This expenditure would be expected to adversely affect workers. These two events were common to both experimental groups and should not have differentially affected either group. Another event transpired two weeks prior to the posttest that may have been more pronounced in the treatment group. The directorate chief, who was over both the divisions from which the experimental groups came, retired. He was respected by the workers for his genuine concern for their welfare. His offices were physically located above where the treatment group worked, and were a mile away from where the control group worked. His departure may have represented a greater loss to the treatment group, as he was exposed to them frequently. There was a leadership change in the control group during the month after the pretest (in June 1978). The former division chief was replaced by a man who, according to opinions of his managerial peers, gave the control group effective leadership it previously did not have.

In order to learn what issues concerned the workers, they were solicited to furnish a brief list of those issues

that concerned them and that they felt affected their work either directly or indirectly. (This solicitation was done over several weeks and was subsequent to the posttest.) The workers from both groups responded with concerns over pay, retirement, and Social Security personnel matters that would, if implemented, impact on all Federal Government employees. They expressed concern over the performance appraisal ruling. They expressed regret over their director's retirement, and they thought he should have received a well-deserved promotion instead of retiring because he did not get promoted. In the treatment group, they were upset over a safety ruling made 31 March 1979 that prohibited bicycles from being brought in the work buildings, and they were irritated at the inconveniences caused by the installation of a security fence in July 1978 around the treatment group work facility.

With the exception of certain topics, such as the fence installation, the bicycle ruling, and the new division chief being hired, all other topics were common to both groups. Even though the retired directorate chief may have been closer personally to the treatment group, it is not clear how his departure might have caused any imbalanced effect upon one group or the other. Whether or not these events had any effect upon morale is difficult, at the very least, to measure. Based on anecdotal data obtained over the course of the program, it appears that no issue

considered critical by the workers, be it a perceived threat, or irritant, or an undesirable circumstance, was eliminated or resolved by the JL-MC. The closest the JL-MC came to successfully dealing with an expressed worker concern was in getting the telephone installed at the security fence. It could be said that the other recommendations of the JL-MC that were implemented may have been of concern to the workers had they not been implemented, but it is unlikely the concern would have been shared by a majority of the workers.

With respect to the three explanations initially proposed, it is likely that the JL-MC had no influence over any issue of importance to many workers.

~~The scope of this thesis did not include any effort~~
to recommend future disposition of the Joint Labor-Management Council, nor was it intended that the results of this research be used as a basis for deciding the future of the Council. Having expressed intent, these comments are made.

1. Programs instituted with the objective of changing some aspect of an existing organization, especially a large organization, usually take time to demonstrate progress toward their objectives. In the non-government sector, businesses sometimes allow several years before finally evaluating the merits of programs designed to enhance productivity (17:vii,92). Perhaps the

posttest measurement was premature and the JL-MC needed more time to engage and solve those issues it could legitimately address and were of concern to the worker.

2. If a second posttest survey of the experimental groups' attitudes (treatment and control) is taken, using the survey instrument previously used, care should be exercised to obtain a sample size distributed among the various workgroups as identical as possible to the sample taken in April 1979.

In summary, eight orthogonal factors were extracted from the survey instrument for measuring the QOWL and perceived productivity. Seven of the eight factors were found to be reliable for measuring Job Significance, Growth Opportunity, Pride in Performance, Overall Job Environment, The Supervisor, Perceived Productivity, and Autonomy. Using all eight factors extracted, no statistically significant differences were found between the posttest treatment and control group mean factor scores, indicating that the JL-MC had no influence upon the QOWL or perceived productivity. This analysis represents an analysis performed at the midpoint of a longitudinal research design. Another analysis will be conducted in the second quarter of FY 80.

APPENDICES

APPENDIX A
QUALITY OF WORKLIFE SURVEY

QUALITY OF WORKLIFE SURVEY

INSTRUCTIONS

- A. If this survey is to be helpful, it is very important that you answer each questions as thoughtfully and frankly as possible. This is not a test and there are no right or wrong answers.
- B. Please answer all questions in order.
- C. All of the questions in the survey can be answered by shading in one of the answer spaces for each question ON THE ANSWER SHEET provided. If you do not find the exact answer that fits your case, use the one that is closest to it. DO NOT fill in more than one answer space for each question.
- D. This survey is designed for automatic scanning of your responses. You are to answer each question by shading in the appropriate space ON THE ANSWER SHEET, as in this "humorous" example:

Found in the survey: Everyone should pay more taxes?

1-----2-----3-----4-----5-----6-----7
 Strongly Disagree Slightly Disagree Neutral Slightly Agree Strongly Agree

RIGHT WAY
 TO MARK
 ANSWER SHEET

1	2	3	4	5	6	7
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WRONG WAYS
 TO MARK
 ANSWER SHEET

	1	2	3	4	5	6	7
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Make your pencil marks on the ANSWER SHEET heavy and fill in the entire space.
- Erase cleanly any answer you wish to change.
- Make no stray pencil markings of any kind.

E. Remember, the value of the survey depends upon your being straight-forward and candid in answering the questions in this survey. No attempt will be made to identify an individual with a particular set of responses.

F. Each section of the survey has short instructions about that section. Please be sure to read them before beginning.

SECTION TWO

This part of the questionnaire asks you to describe your job as objectively as you can.

Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below.

To what extent does your job require you to work with mechanical equipment?

1-----2-----3-----4-----5-----6-----7

Very little; the job requires almost no contact with mechanical equipment of any kind.

Moderately

Very much; the job requires almost constant work with mechanical equipment.

You are to mark on the answer sheet the number which is the most accurate description of your job.

If, for example, your job requires you to work with mechanical equipment a good deal of the time--but also requires some paperwork--you might mark the number 6.

1 1 2 3 4 5 6 7
1

If you do not understand these instructions, please ask for assistance.

NOTICE: Beginning at this point and continuing throughout the survey, the responses you have to select from are numbered (e.g., 1 thru 7) rather than lettered (e.g., A thru F).

PUT ANSWERS ON ANSWER SHEET

1. To what extent does your job require you to work closely with other people (either clients or people in related jobs in your own organization)?

1-----2-----3-----4-----5-----6-----7
Very little; dealing with other people is not at all necessary in doing the job. Moderately; some dealing with others is necessary. Very much; dealing with other people is an absolutely essential and crucial part of doing the job.

2. To what extent does doing the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing--aside from any "feedback" co-workers or supervisors may provide?

1-----2-----3-----4-----5-----6-----7
Very little; the job itself is set up so I could work forever without finding out how well I am doing. Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not. Very much; the job is set up so that I get almost constant "feedback" as I work about how well I am doing.

3. To what extent do you enjoy performing the actual day-to-day activities that make up your job?

1-----2-----3-----4-----5-----6-----7
Very little; I rarely enjoy the daily activities of my job. Moderately; sometimes I do and sometimes I don't. Very much; I almost always enjoy the daily activities of my job.

4. To what extent are there things about working here (people, policies or conditions) that encourage you to work hard?

1-----2-----3-----4-----5-----6-----7
Very little; this place does not inspire me to work hard. Moderately; sometimes I feel like working hard and sometimes I don't. Very much; I often feel like working hard.

5. To what extent do managers or co-workers let you know how well you are doing your job?

1-----2-----3-----4-----5-----6-----7
Very little; people almost never let me know how well I am doing. Moderately; sometimes people may give me "feedback;" other times they may not. Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.

PUT ANSWERS ON ANSWER SHEET

SECTION THREE

Now please indicate how you personally feel about your job.

Each of the statements below is something that a person might say about his or her job. You are to indicate your own, personal feelings about your job by marking how much you agree with each of the statements.

Place your answers ON THE ANSWER SHEET in accordance with the following scale:

<u>How much do you agree with the statement?</u>						
1-----	2-----	3-----	4-----	5-----	6-----	7-----
Disagree	Disagree	Disagree	Neutral	Agree	Agree	Agree
Strongly		Slightly		Slightly		Strongly

- R 6. I feel that most of the things I do on my job are meaningless.
- R 7. I have difficulty getting the tools and supplies I need on my job.
- R 8. I don't care very much how well my work gets done.
- R 9. I frequently have to stop to get the things that I need on my job.
- R 10. The job itself provides very few clues about whether or not I am performing well.
- 11. I feel personally responsible for the work I do on my job.
- R 12. I do not have enough training to do my job well.
- 13. It's important to me that I do my job well.
- 14. Just doing the work required by the job provides many chances for me to figure out how well I am doing.
- 15. The things I do on my job are important to me.
- 16. I have all the skills I need in order to do my job.
- 17. The work I do on my job is meaningful to me.
- R 18. I have trouble getting the facts and information I need to do my job well.

PUT ANSWERS ON ANSWER SHEET

PUT ANSWERS ON ANSWER SHEET

How much do you agree with the statement?

1-----	2-----	3-----	4-----	5-----	6-----	7-----
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

- R 39. Some of the groups we have to deal with "won't give an inch."
40. My supervisor leaves it up to me to decide how to go about doing my job.
41. My supervisor encourages subordinates to participate in important decisions.
42. My supervisor keeps subordinates informed.
- R 43. My supervisor never gives me a chance to make important decisions on my own.
44. My supervisor keeps informed about how subordinates think and feel about things.
- R 45. I don't care what happens to this organization as long as I get my pay check.
46. Activities are well planned here.
- R 47. You can take it easy and still get your work done.
48. I will probably look for a new job in the next year.
49. Getting a lot of work done is important to people here.
50. This is a highly efficient, work-oriented place.
51. There are always deadlines to be met in this organization.
52. What happens to this organization is really important to me.

PUT ANSWERS ON ANSWER SHEET

PUT ANSWERS ON ANSWER SHEET

SECTION FOUR

Now, please indicate how satisfied you are with each aspect of your job listed below.

Place your answers ON THE ANSWER SHEET in accordance with the following scale.

<u>How satisfied are you with an aspect of your job?</u>						
1-----	2-----	3-----	4-----	5-----	6-----	7-----
Extremely Dissatis- fied	Dissatis- fied	Slightly Dissatis- fied	Neutral	Slightly Satisfied	Satis- fied	Extremely Satisfied

How satisfied are you with:

53. the way you are treated by the people you work with?
54. the amount of support and guidance you receive from your supervisor?
55. the chances you have to learn new things.
56. the chances you have to do something that makes you feel good about yourself as a person?
57. the chances you have to do the things you do best?
58. the friendliness of the people you work with?
59. the chances you have to accomplish something worthwhile?
60. the respect you receive from the people you work with?
61. the degree of respect and fair treatment you receive from your boss?
62. the quality of the equipment you work with?
63. the resources you have to do your job?
64. the overall quality of the supervision you receive in your work?

PUT ANSWERS ON ANSWER SHEET

SECTION FIVE

Listed below are a number of characteristics which could be present on any job.

Place your answers ON THE ANSWER SHEET in accordance with the following scale.

To what degree are these characteristics present on your job?						
1-----	2-----	3-----	4-----	5-----	6-----	7-----
Never	Very Seldom	Seldom	Occasion- ally	Often	Very Often	Always

65. Members of my work group take a personal interest in each other.
66. My immediate supervisor communicates often with me.
67. Members of my work group talk to each other about their personal problems.
68. Members of my work group eat lunch together.
69. The directions and guidance I receive from my supervisor are clear, concise and understandable.
70. The communications I have with my immediate supervisor are worthwhile.

PUT ANSWERS ON ANSWER SHEET

PUT ANSWERS ON ANSWER SHEET

SECTION SIX

Every employee produces something in his or her work. It may be a "product" or it may be a "service." It is sometimes difficult, however, to identify that product or service. Listed below are some of the products or services produced at an installation.

equipment calibrated	pay vouchers	work orders
typed pages	packaging	jobs planned
contracts	technical	procedures
reports	assistance	written
	classifications	food prepared

These are just a few of the products or services to be found. There are others, of course. We would like you to think carefully of the things YOU produce, and also of the things produced by those people who work with you in your work group (i.e., everyone who works for your boss).

There is a scale provided for each question. Select the response numbers (1 thru 5) you are most comfortable with and fill in answer sheet.

71. Thinking now of the various things produced by the people you know in your work group, how MUCH are they producing?

1-----2-----3-----4-----5
It is very low. It is fairly low. It is neither high nor low. It is fairly high. Their production is very high.

72. How good would you say is the QUALITY of the products or services produced by the people you know in your work group?

1-----2-----3-----4-----5
The quality is poor. The quality is not good. The quality is fair. The quality is good. The quality is excellent.

73. Do the people in your work group seem to get maximum output from the resources (money, people, equipment, etc.) they have available? That is, how EFFICIENTLY do they work?

1-----2-----3-----4-----5
They do not work efficiently at all. Not too efficient. Fairly efficient. They are very efficient. They are extremely efficient.

THE SURVEY IS NOW COMPLETE. THANK YOU FOR YOUR COOPERATION.

PUT ANSWERS ON ANSWER SHEET

APPENDIX B
HYPOTHESIZED FACTORS

<u>Factor</u>	<u>Items</u>
1. Dealing with Others	1, 19, 34
2. Feedback from the Job	2, 10, 14
3. Motivating Conditions	3, 4
4. Feedback from Agents	5, 28, 33
5. Experienced Meaningfulness	6, 15, 17
6. Resource Adequacy	7, 9, 18
7. Experienced Responsibility	8, 11, 13
8. Experienced Skill Adequacy	12, 16
9. Alienation	21, 22
10. General Satisfaction	23, 30, 20, 36, 27
11. Peer Cohesion	25, 65, 67, 68
12. Communication	26, 66, 70, 69
13. Intrinsic Motivation	29, 32, 35
14. General Information	37, 24, 38
15. Quality of Intra-Group Relations	31, 39
16. Supervisory Delegation & Participation	41, 40, 43
17. Supervisory Role Support	42, 44
18. Organizational-Involvement	45, 52
19. Turnover	48
20. Task Orientation	49, 50, 46, 47, 51
21. Satisfaction with Interpersonal Relations	53, 58, 60
22. Satisfaction Intrinsic Rewards	55, 56, 57, 59
23. Satisfaction with Supervision	54, 61, 64
24. Satisfaction with Work Environment	62, 63
25. Perceived Productivity - Quantity	71
26. Perceived Productivity - Quality	72
27. Perceived Productivity - Efficiency	73

APPENDIX C
ABBREVIATED FACTOR ANALYSIS AND COEFFICIENT ALPHA VALUES

TABLE 2

ABBREVIATED FACTOR ANALYSIS AND
COEFFICIENT ALPHA VALUES

Item	Loading	Alpha	Item	Loading	Alpha
	<u>Factor 1</u>			<u>Factor 2</u>	
21	-.7376	-	59	.7756	-
22	-.6512	.7223	55	.7212	.7708
30	.6290	.7495	56	.7082	.8260
29	.5663	.7641	57	.6938	.8676
6	.5405	.7833	53	.6077	.8621
23	.5268	.8046	60	.5790	.8659
10	.5237	.8171	54	.5719	.8798
35	.4939	.8351	41	.4815	.8807
18	.4934	.8474	65	.4514	.8809
12	.4674	.8575	42	.3898	.8851
	<u>Factor 3</u>			<u>Factor 4</u>	
15	.6916	-	63	.6444	-
13	.5953	.6699	62	.6226	.8277
19	.5583	.6757	70	.5792	.7938
17	.5294	.7048	61	.5617	.8358
14	.5112	.7327	69	.5585	.8690
20	.4738	.7540	64	.5023	.8865
16	.4703	.7724	58	.4813	.8923
11	.4540	.7830	46	.4581	.8988
52	.3910	.7954	66	.3991	.9006
8	.3497	.7948	36	.3592	.9072

TABLE 2--Continued

Item	Loading	Alpha	Item	Loading	Alpha
	<u>Factor 5</u>			<u>Factor 6</u>	
44	.5238	-	72	.8291	-
33	.5067	.5965	71	.7791	.8539
42	.4912	.7271	73	.7183	.8744
54	.4576	.7901			
41	.4487	.8218			
28	.4450	.8043			
5	.4104	.8140			
66	.3842	.8323			
64	.3606	.8519			
25	.3356	.8523			
	<u>Factor 7</u>			<u>Factor 8</u>	
38	.6459	-	39	.4838	-
37	.6015	.7915	31	.4031	.5531
40	.5149	.7662	7	.3828	.5349
36	.4875	.7984	4	.3454	.5617
35	.4780	.8455	48	-.3197	.6000
52	.3975	.8687			
34	.3402	.8494			
3	.3342	.8551			
50	.3319	.8582			
46	.3187	.8662			

APPENDIX D
ANOCOVA SUMMARY TABLES

TABLE 3

ANCOVA SUMMARY TABLE; JOB SIGNIFICANCE

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
 SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
 FAC1 POSTMEAS1
 BY IGRP GROUP
 WITH COV1 PREMEAS1

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.202	1	0.202	1.543	0.230
COVARIATES	0.202	1	0.202	1.543	0.230
COV1	0.175	1	0.175	1.336	0.263
EXPLAINED	0.377	2	0.188	1.440	0.263
RESIDUAL	2.354	18	0.131		
TOTAL	2.731	20	0.137		

TABLE 4
ANCOVA SUMMARY TABLE; GROWTH OPPORTUNITY

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
FAC2 POSTMEAS2
BY IGRP GROUP
WITH COV2 PREMEAS2

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.244	1	0.244	2.851	0.109
IGRP	0.244	1	0.244	2.851	0.109
COVARIATES					
COV2	0.002	1	0.002	0.018	0.895
COV2	0.002	1	0.002	0.018	0.895
EXPLAINED	0.246	2	0.123	1.434	0.264
RESIDUAL	1.542	18	0.086		
TOTAL	1.787	20	0.089		

o.

TABLE 5

ANCOVA SUMMARY TABLE; PRIDE IN PERFORMANCE

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
 SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
 FAC3 POSTMEAS3
 BY IGRP GROUP
 WITH COV3 PREMEAS3

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.107	1	0.107	1.026	0.325
COVARIATES	0.107	1	0.107	1.026	0.325
COV3	0.016	1	0.016	0.152	0.702
EXPLAINED	0.016	1	0.016	0.152	0.702
RESIDUAL	0.122	2	0.061	0.589	0.565
TOTAL	1.872	18	0.104		
	1.994	20	0.100		

TABLE 6
ANOCOVA SUMMARY TABLE; OVERALL JOB ENVIRONMENT

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****

***** FAC4 POSTMEAS4 *****
BY IGRP GROUP *****
WITH COV4 PREMEAS4 *****

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.028	1	0.028	0.292	0.595
	0.028	1	0.028	0.292	0.595
COVARIATES					
COV4	0.003	1	0.003	0.032	0.860
	0.003	1	0.003	0.032	0.860
EXPLAINED	0.031	2	0.015	0.162	0.852
RESIDUAL	1.709	18	0.095		
TOTAL	1.739	20	0.087		

TABLE 7

ANOCOVA SUMMARY TABLE; THE SUPERVISOR

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
 SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
 FAC5 POSTMEAS5
 BY IGRP GROUP
 WITH COV5 PREMEAS5

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	0.257	1	0.257	1.937	0.181
IGRP	0.257	1	0.257	1.937	0.181
COVARIATES	0.255	1	0.255	1.917	0.183
COV5	0.255	1	0.255	1.917	0.183
EXPLAINED	0.512	2	0.256	1.927	0.174
RESIDUAL	2.392	18	0.133		
TOTAL	2.904	20	0.145		

TABLE 8

ANOCOVA SUMMARY TABLE; PERCEIVED PRODUCTIVITY

ANALYSIS OF COVARIANCE									
FILE	FINALFAC	(CREATION DATE = 08/13/79)							
SUBFILE	CONG	TREG	ANALYSIS OF VARIANCE						
			SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF		
							OF F		
BY IGRP			0.031	1	0.031	0.393	0.538		
WITH COV6			0.031	1	0.031	0.393	0.538		
COVARIATES			0.019	1	0.019	0.240	0.630		
COV6			0.019	1	0.019	0.240	0.630		
EXPLAINED			0.049	2	0.025	0.317	0.733		
RESIDUAL			1.399	18	0.078				
TOTAL			1.448	20	0.072				

TABLE 9
ANCOVA SUMMARY TABLE; AUTONOMY

ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
SUBFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
FAC7 POSTMEAS7
BY IGRP GROUP
WITH COV7 PREMEAS7

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.010	1	0.010	0.089	0.768
COVARIATES					
COV7	0.143	1	0.143	1.314	0.267
EXPLAINED	0.152	2	0.076	0.702	0.509
RESIDUAL	1.953	18	0.108		
TOTAL	2.105	20	0.105		

TABLE 10
ANCOVA SUMMARY TABLE; WORK IRRITANTS

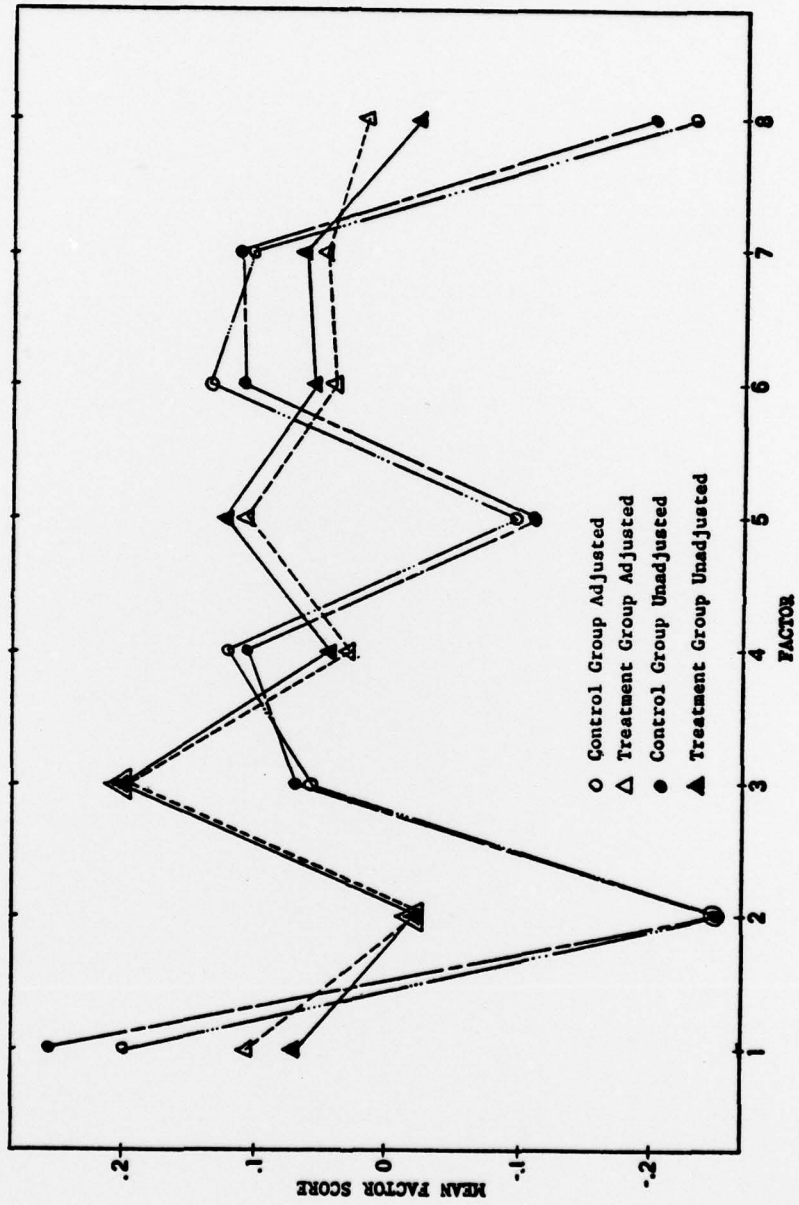
ANALYSIS OF COVARIANCE

FILE FINALFAC (CREATION DATE = 08/13/79)
 SUHFILE CONG TREG

***** ANALYSIS OF VARIANCE *****
 FAC8 POSTMEAS8
 BY IGRP GROUP
 WITH COV8 PREMEAS8

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS					
IGRP	0.202	1	0.202	1.365	0.250
COVARIATES					
COV8	0.133	1	0.133	0.900	0.355
EXPLAINED	0.334	2	0.167	1.133	0.344
RESIDUAL	2.657	18	0.148		
TOTAL	2.992	20	0.150		

APPENDIX E
PLOT OF POSTTEST MEAN FACTOR SCORES



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